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ABSTRACT

The Mathematics Assessment Process (MAP) for the Middle Grades gives teachers and school reform leaders new tools to examine and systematically realign mathematics programs. MAP engages an interdisciplinary coalition within a school in an exploration of mathematics instructional excellence. Through an extensive self-study, a school answers the question, "How well is our mathematics program meeting the needs of the students in our school?" MAP integrates three central ideas: consensus on the need for major revisions in middle-grades mathematics, need to implement effective mathematics instructional practices targeted for adolescents, and existence of practical, tested strategies for planning change that can guide the restructuring of middle-grades mathematics programs. At the core of MAP is a set of "Criteria for Excellence" developed by a national advisory panel of middle-grades practitioners summarizing the principles underlying outstanding middle-grades mathematics education. This document, "Staff Development Guidelines," the third in a set of three volumes, presents a series of seven staff development workshops enabling a school's team leaders to direct its own site-based preparation for using MAP. In addition to detailed instructions on how to conduct each workshop, a comprehensive appendix offers practical suggestions to team leaders about leading workshops for professional colleagues and other adult learners. It also outlines hints for coordinating the logistics of the assessment process. (MDH)

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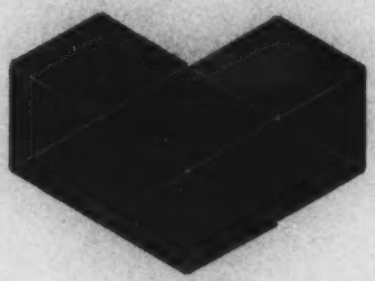
MAP

Mathematics Assessment Process for the Middle Grades

Volume III

STAFF DEVELOPMENT GUIDELINES



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Acknowledgments

This program planning and change model has benefited from the creative contributions of a distinguished partnership of professionals. Their work reflects the changing nature of mathematics learning and the needs of young adolescents in the last decade of the twentieth century. Teachers, principals, and central office administrators from the school districts that field tested earlier versions of the model actively participated in its development and refinement, establishing practical and workable process.

The field-test version of MAP was designed at the Center for Early Adolescence at the University of North Carolina at Chapel Hill. It built upon the Center's extensive experience with programs dedicated to enriching educational opportunities and community support for young adolescents. Two Center publications were particularly influential, Joan Lipsitz's *Successful Schools for Young Adolescents* and Gayle Dorman's *Middle-Grades Assessment Process (MGAP)*.

Many individuals were especially resourceful contributors to the early phases of this work. Rebecca B. Corwin of Lesley College and the Technical Educational Research Center (TERC), the co-author of Section II, drafted the first set of assessment questions, and helped modify early versions of the Criteria and Ideals. Her insights into and appreciation of teachers' power as leaders, assessors, and curriculum strategists molded the first edition of this assessment. As we modified the MAP framework to make it practical for middle schools, Daria Courtney, Evette Horton, and Carol Capper thoughtfully edited and re-edited versions of the text and the instruments, striving to make them personal, professionally provocative, and in the end, educationally beneficial for students. They also recommended the resources provided in this pilot edition of MAP, seeking those that would be most useful to practitioners.

Two committed advisory panels—whose members are listed in the Appendices—established a high standard for what MAP could accomplish. Their advice and ideas throughout each development phase strengthened the product. At North Carolina State University, the staff of the Center for Research in Mathematics and Science Education lent able assistance as we piloted MAP and completed this revised edition. We thank especially Sally Berenson, Delores Evangelista, and Lyn Billington for their expertise, patience, and "can do" attitude. Colleagues Jim Wilson and Tom Cooney at the University of Georgia served as a sounding board for this project, posing probing questions and offering thoughtful advice as we developed and tried out the assessment materials.

And finally, but significantly, we were extremely fortunate to have the support of Barbara Scott Nelson and Barbara Hatton at The Ford Foundation, and Pat Willis at the BellSouth Foundation. These program officers unfailingly encouraged us to be inventive and original. Their sustained interest and enthusiasm for our ideas fueled our optimism about the potential of teacher-led educational improvement, thus enabling us to build a model that is fully teacher-led and student-centered.

Preface

The Mathematics Assessment Process for the Middle Grades (MAP) is a program evaluation guide designed to assess needs and to direct improvements in middle-grades mathematics programs. It is structured on the basis of the National Council of Teachers of Mathematics' *Curriculum and Evaluation Standards for School Mathematics* and recent national reports that call for middle-grades mathematics to be more problem-centered, experience-based, and connected to modern technological society. MAP engages an interdisciplinary team of educational stakeholders—teachers, administrators, parents, and students—in a participatory process that defines the future direction of schools' mathematics programs.

MAP has a dual emphasis. First, it recognizes that effective mathematics teaching occurs within a partnership. It is most successful when mathematics teachers have the sustained collaboration of school- and district-level administrators, colleagues across disciplines, and community members and parents. Second, MAP is a framework for improvement. Recognizing the critical importance of the middle-school years, MAP establishes that effective teaching is developmentally appropriate and proposes how to design an educational program that responds to the normal changes and uncertainties of 10- to 15-year-old learners.

MAP includes three volumes of materials that, together, provide a school or school district with a self-contained set of tools for conducting its own mathematics program assessment. The contents of each volume are described below.

Volume 1: User's Manual

The *User's Manual* includes guidelines and resources for completing an assessment and directions on how to develop a long-range plan for modernizing and improving a mathematics program. It is designed with a schoolwide focus, so it can be used by an interdisciplinary team or a mathematics department within a school. It also can be easily adapted for use by a group of schools within a district, state, or region.

Section 1 — Section 1 discusses the need for MAP by describing the trends in middle-grades mathematics; and introduces the MAP "Criteria for Excellence"—the content that frames the program.

Section 2 — Section 2 explores the philosophic core of MAP through a discussion of the Criteria for Excellence. Arguing that mathematics is fundamentally a communication and problem-solving process, this section suggests examples of how the Criteria apply in middle-grades classrooms and in the community.

Sections 3 and 4 — Sections 3 and 4 take team members—step-by-step—through the approach to conducting MAP: collecting, analyzing and summarizing the data; and

writing recommendations and an action plan for implementing changes. By following the process described in these sections, schools will complete MAP and use their findings to redesign their mathematics program so that it is consistent with the MAP Criteria for Excellence and with the recommendations of the NCTM *Curriculum and Evaluation Standards for School Mathematics*.

Section 5

Section 5 provides a staff development exercise that is designed to help schools establish a shared understanding of how mathematics programs can be more responsive to the unique needs of 10- to 15-year-olds. "Puzzling and Problem Solving: Creating Responsive Mathematics Programs for Young Adolescents" is to be completed by the faculty, mathematics department staff, parents, and administrators within a school as they begin the assessment process.

Section 6

A series of annotated resource lists completes the MAP *User's Manual* and serves as a reference for teachers, school personnel, and parents. Selected for their practicality and accessibility, these suggested references provide the research basis of the concepts within MAP. Teams may turn to the resources in these lists as they conduct their assessments and when they search for ideas about drafting a plan of action for improving their mathematics programs.

Appendices

The Appendices include guidelines for making logistical decisions throughout the assessment process and a glossary of mathematics terms used in assessment.

Volume II: MAP Instruments

Ten assessment instruments—interviews, observations, and surveys—are the core of the data-gathering process. The instruments are included in Volume II, along with descriptive material that will help teams organize and use them.

Volume III: Staff Development Guidelines

A series of seven staff development workshops enables a school's team leaders to direct its own site-based preparation for using MAP. In addition to detailed instructions on how to conduct each workshop, a comprehensive appendix offers practical suggestions to team leaders about leading workshops for professional colleagues and other adult learners. It also outlines hints for coordinating the logistics of the assessment process.

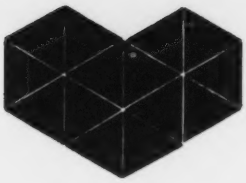
Mathematics Assessment Process for the Middle Grades (MAP): Project History

Initially conceived in 1987, by the Center for Early Adolescence at the University of North Carolina at Chapel Hill, MAP emerges from a concept that was designed and first field-tested in 14 middle-grades schools. The earlier version was planned as a supplement to the Center's *Middle Grades Assessment Program* (MGAP) (Dorman, 1984).

Beginning in September 1989, MAP was reconceptualized and modified to meet the developing standards of the national reform movement. Mathematics educators from North Carolina State University and the University of Georgia were selected to lead the piloting and revision of MAP. Following a year-long trial, researchers modified the program to bring it in line with new expectations for mathematics improvement and tested it in nine schools within seven school districts nationally.

Throughout the development process, mathematics teachers, supervisors, and school administrators played strong roles in molding the program. The pilots occurred in very different school contexts and communities, assuring the relevance and practicality of MAP to life in schools. In its four years of development, several hundred school- and district-level educators, parents, students, and university researchers contributed to the design and to the trials of the assessment instruments and the implementation process. Too numerous to name each one, these committed school-site practitioners willingly and continually advised and critiqued this process, helping the authors keep it "grounded" and practical for today's schools. The names of advisory board members and lead personnel associated with the project during its development are included in Appendix 4 of Volume I.

MAP evolves from a strong collaboration of middle-grades practitioners and researchers. As a result, its design reflects the commitment to mathematics education renewal that exists within middle-grades schools. Given time for reflection and analysis, along with committed internal and external administrative support for examining programs and planning improvements, teachers are innovative and energetic leaders of change. In the hands of site-based educators, MAP is a powerful tool for strengthening educators' capacity to change and to advance mathematics programs and teaching practices.



Volume III:

STAFF DEVELOPMENT GUIDELINES

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Notes on Resources

An Introduction to the Mathematics Assessment Process for the Middle Grades (1 hour) . . . . . Workshop 1

MAP Criteria for Excellence (1 hour) . . . . . Workshop 2

Understanding MAP Procedures (1.5 hours) . . . . . Workshop 3

Using MAP Assessment Tools: Overview (1 hour) . . . Workshop 4

Using Interviews and Surveys (2.5 hours) . . . . . Workshop 5

Conducting MAP Observations (2 hours) . . . . . Workshop 6

Summarizing Data Within Cluster Groups (3 hours) . . . . . Workshop 7

Completing the Assessment Process . . . . . Introduction to Workshops 8 and 9

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Completing Action Plans (3 hours) . . . . . Workshop 9

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- Conducting MAP Workshops: Suggestions for Team Leaders . . . . . Appendix 1
- Implementing MAP Workshops: Logistical Considerations . . . . . Appendix 2
- Examples of MAP Action Plans . . . . . Appendix 3

PREFACE

What follows are guidelines for conducting school site workshops for implementing the ***Mathematics Assessment Process for the Middle Grades (MAP)***. The workshops are in outline form, suggesting a flexible structure for teams learning to conduct MAP. The workshops have two purposes:

1) To guide team members and colleagues in understanding MAP and in learning to use its procedures effectively; and

2) To inform colleagues about ways middle-grades schools can better serve their students through improved mathematics programming.

MAP is a program assessment tool--a self-study process. At the same time, however, it can be a significant staff development experience for teachers. Through MAP, teachers expand their knowledge about the school's mathematics program, evaluating how well it addresses the learning needs of young adolescent students. The major outcome of this process is an in-depth knowledge by teachers about the school's mathematics offerings and a systematically developed plan of action for modifying and updating it.

For teacher leaders who are new to the experience of conducting staff development programs with colleagues, an extensive introduction to working with adult learners is provided in the Appendix of this volume. It will be beneficial to review Appendix 1, Conducting Staff Development Workshops: Suggestions for Team Leaders, before embarking on the assessment program in your school. Also included as Appendices 2 and 3 are materials to support the team collaboration and logistical organizing that is required. Finally, Appendix 4 provides two examples of MAP action plans that were developed at pilot sites.

These materials have been extensively pilot tested. Experience taught that each school community and faculty has very different staff development expectations and needs. Thus, as your school conducts MAP, pick and choose the procedures and workshops that are most responsive to the site's individual characteristics.

NOTE ABOUT
STAFF DEVELOPMENT RESOURCES

MAP workshops recommend specific resources that support and supplement sessions. Transparencies and handouts are included at the conclusion of each outline; the resources refer to readings in the **MAP User's Manual**, and the reports or articles referenced are listed and described in the **User's Manual**, Section 6, *Annotated Resource Lists*.

The appendices in this volume are an additional resource for MAP teams. Appendices 1, 2, and 3 advise team leaders and members about how to lead effective staff development meetings with colleagues. They offer practical suggestions that ensure meetings flow smoothly, and checklists that remind members of important logistical tasks that need completing.

Finally, Appendix 4 includes two very different solutions to action planning that were written by MAP pilot sites. These samples help schools envision the outcome of the Mathematics Assessment Process for the Middle Grades.

Workshop Outline 1
An Introduction to Mathematics Assessment Process for the Middle Grades

Purpose

To review the goals of the Mathematics Assessment Process for the Middle Grades, its research base, and the philosophic foundation of the Criteria for Excellence.

Resources

1. **MAP User's Manual**: *Introduction* and Section 1, *MAP: An Agent of Change*, as appropriate.

2. **MAP User's Manual**: Section 6, selected articles as appropriate, especially Steen, "Mathematics Education: Predictor of Scientific Competitiveness."

3. The following significant references that are described in **MAP**, Section 6, Annotated Resource Lists (National Reports Section): **Everybody Counts** and **Reshaping School Mathematics**, by the National Research Council of the Mathematics and Science Education Board; **Curriculum and Evaluation Standards for School Mathematics** and **Professional Standards for School Mathematics** by the National Council of Teachers of Mathematics.

5. Key Features of MAP (Handout 1.1)

Transparencies

1. Mathematics is a Way of Thinking

2. Goals of MAP

3. An Effective Middle-Grades Mathematics Program Accepts the Challenge of Improvement in Three Key Areas

4. What Will MAP Do for Our School?

KEY FEATURES OF MAP

1. ***Map Is Fundamentally A Qualitative Study of Mathematics Practice***:

MAP is more a **qualitative** study than a quantitative one. Some have described MAP as a vehicle for schools to use in conducting an "ethnography" -- a descriptive overview of the mathematics program from various points of view. Although it uses survey techniques, it is not a survey or poll. Instead, MAP applies several research tools to gather a "sense of the community" with respect to the Criteria for Excellence.

2. ***MAP Study Goals***:

MAP is a process for **studying** the mathematics program, not an evaluation of an individual or group of individuals. Its **goals** are to:

- Determine the *current status* of the program
- Identify *mathematics program needs*
- Design an *Action Plan* for mathematics program improvement.

3. ***Major Elements of the Process***:

The following elements are the essence of MAP:

- The process is **participatory** -- a number of stakeholders are involved.
- It is **directed by teachers**, collaboratively
- It involves an **interdisciplinary team** of classroom teachers within the school.
- The interdisciplinary team includes **parent** and/or **business collaboration** throughout the process.
- The needs assessment **uses a combination of data gathering tools** to arrive at its results, including classroom observations of practice, interviews with colleagues, parents, and students, and traditional quantitative data, e.g. test scores, demographics, etc.
- On the basis of the **Criteria for Excellence** of effective middle-grades mathematics programs, the school determines how **consistent or inconsistent** its current program is with those criteria.
- The process explores the rationale for redesigning the way mathematics is taught and builds on the **wisdom of practice** among middle-grades mathematics professionals.

4. ***Flexibility Within a Systematic Structure***:

Teams conduct the needs assessment in cluster groups. Each cluster group documents the mathematics program's consistency or inconsistency with the MAP Criteria for Excellence from the point of view of its particular stakeholder group (e.g. MTC - math teachers; IF - other faculty and staff; ASC - parent and community.) Cluster groups may adjust the data gathering procedures (e.g, gather data in groups or from a sample at the school) or modify the questionnaires (e.g., shorten them, select specific questions, etc.) as needed, recognizing that their goal is to obtain the data needed for action plans.

5. **Summary of MAP Key Features**

MAP recognizes that to gather the most useable and objective information, these guidelines must be followed:

- Data are gathered in a manner that assures anonymity and confidentiality.
- Various kinds of data (observation, interview, survey) are gathered from the different stakeholder groups.
- The qualitative nature of the data implies a certain subjectivity. Multiple points of view, analyses, and assessments of the data -- **not just item counts** -- reveal the meaning the evidence offers. It may be helpful to look at percentages of responses, but ultimately, the informed analysis and thoughtful consideration of the data by the professionals on the team provide the information on which to base the school's Action Plan.

Goals of MAP

MAP is a process for **studying** the school's mathematics program, not an evaluation of an individual or group of individuals. Its **goals** are to:

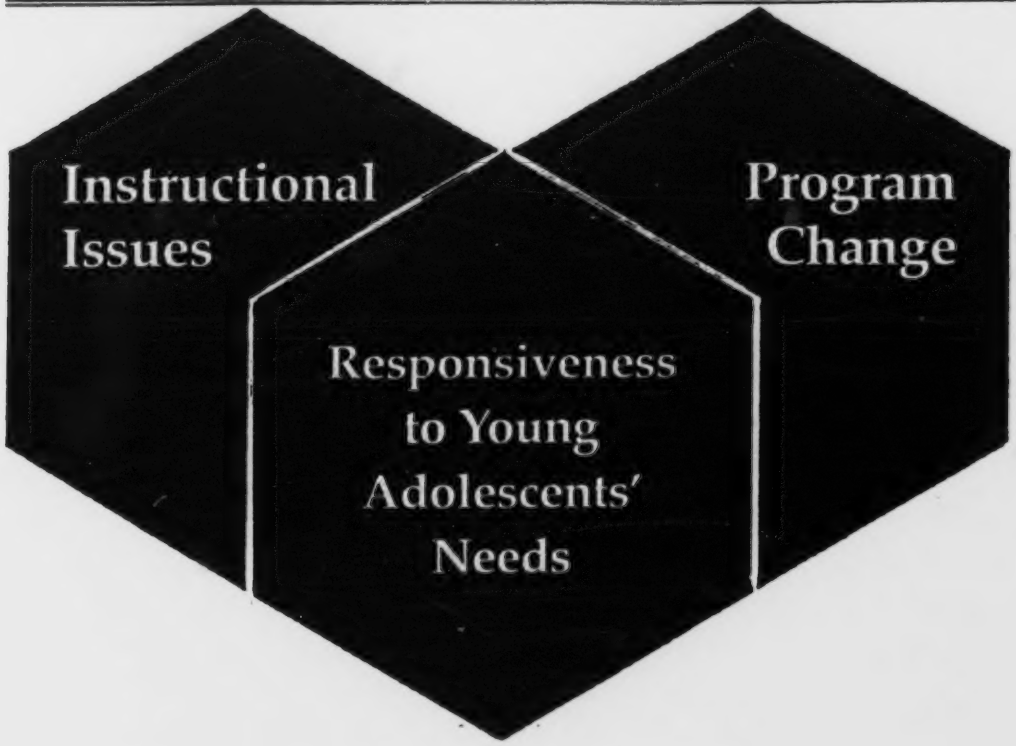
- Determine the *current status* of the mathematics program
- Identify *program needs*
- Design an *Action Plan* for improvement

c. CATALYST/NCSU, 1991.

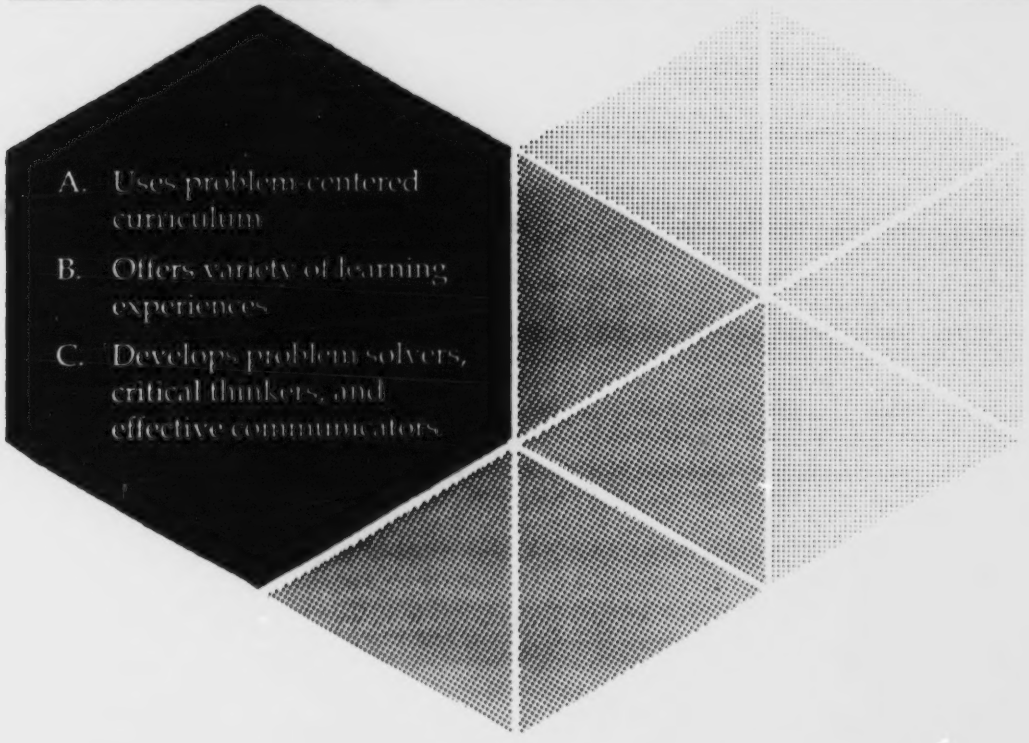
Mathematics is a Way of Thinking

- ***Everyone*** **can think mathematically.**
- **Mathematical thinking can be improved by *practice* with *reflection*.**
- **Mathematical thinking is provoked by *contradiction*, *tension* and *surprise*.**
- **Mathematical thinking is supported by an atmosphere of *questioning*, *challenging* and *reflecting*.**
- **Mathematical thinking helps in *understanding oneself* and the world.**

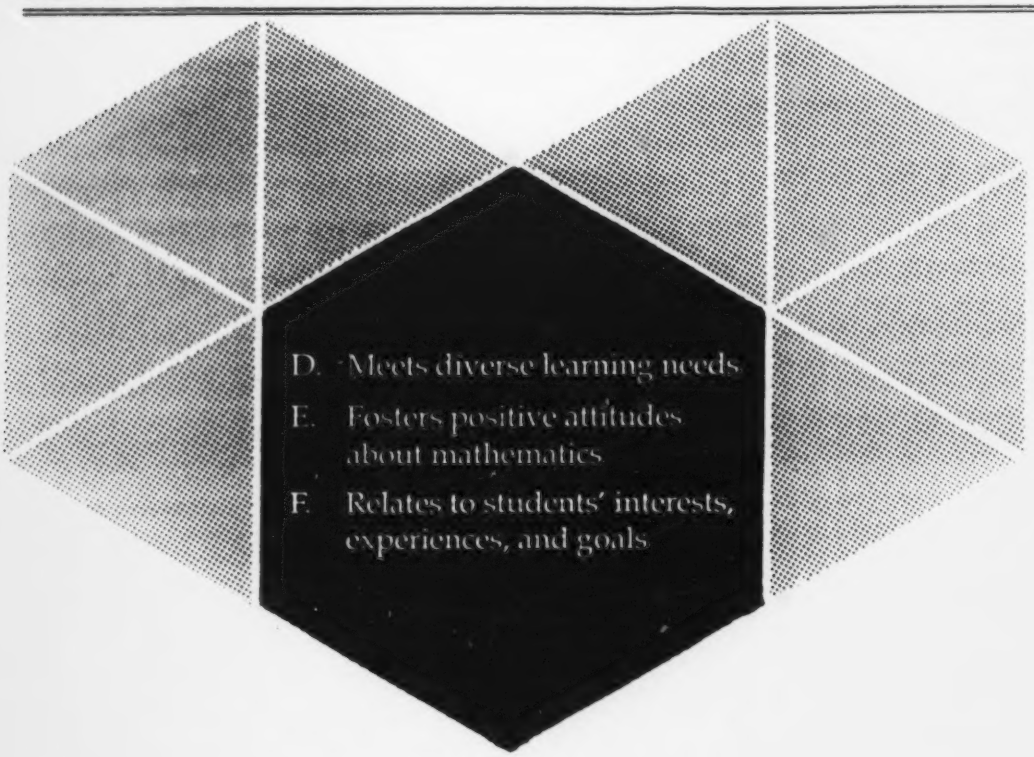
An Effective Middle-Grades Mathematics Program Accepts the Challenge of Improvement in Three Key Areas:



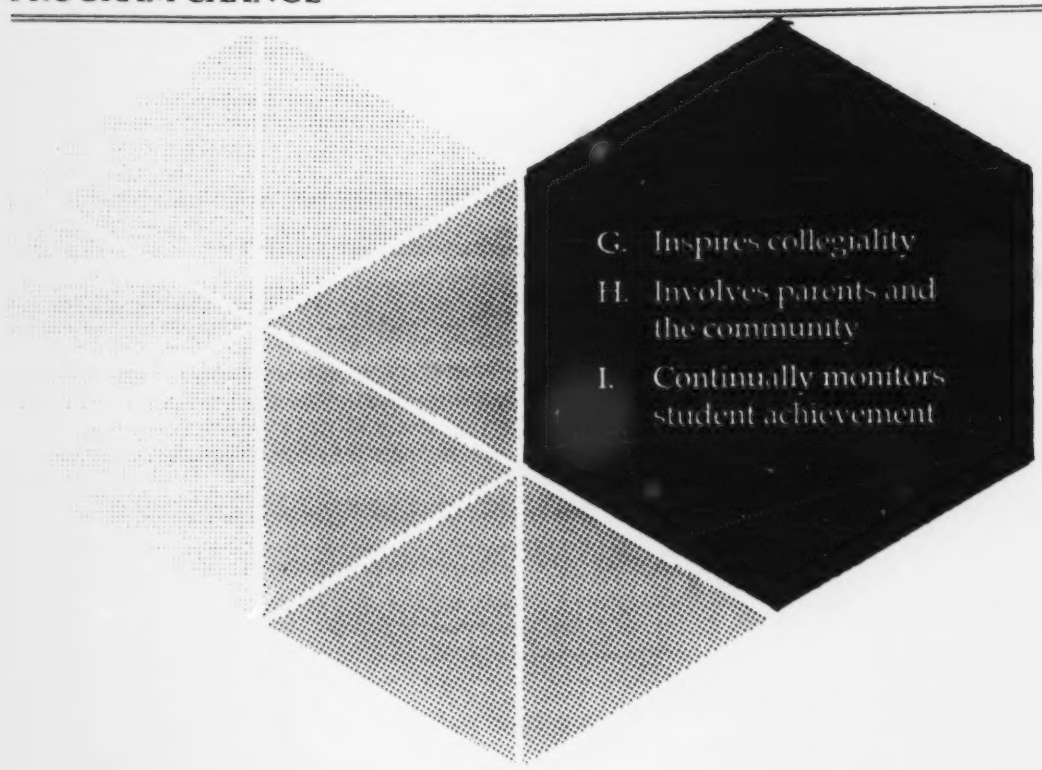
INSTRUCTIONAL ISSUES


A. Uses problem-centered curriculum
B. Offers variety of learning experiences
C. Develops problem solvers, critical thinkers, and effective communicators

RESPONDING TO YOUNG ADOLESCENTS


D. Meets diverse learning needs
E. Fosters positive attitudes about mathematics
F. Relates to students' interests, experiences, and goals

PROGRAM CHANGE



What Will MAP Do for Our School?

- Build a school-wide understanding of the mathematics needs of students.
- Unite parents, local community leaders, and teachers around a consensus for mathematics program improvement in our school.
- Establish a plan for revising the mathematics program according to student needs and community expectations.
- Prepare a knowledgeable, interdisciplinary group of school leaders who are positioned to direct our mathematics program improvement process.
- Bring the school's mathematics program in line with current research and national goals.

Workshop Outline 2
MAP Criteria for Excellence

Purpose

To examine the Criteria for Excellence and consider the match between the MAP philosophy of mathematics teaching and learning and the school's current approach.

Objectives

1. Examine and discuss participants' understanding of the nine MAP Criteria for Excellence.
2. With team members, conduct the Pre-Assessment Inquiry to develop a shared understanding of the Ideals and to complete a pre-assessment of the mathematics program.
3. Understand that the final assessment of the school's consistency with the Criteria and Ideals will be made through data gathering and analysis that will form the basis for the action planning.

Resources

1. **User's Manual**: Section 2
2. Criteria for Excellence Pre-Assessment Inquiry (Handout 2.1)

Transparencies

1. Criteria for Excellence

c. CATALYST/NCSU, 1991.

Mathematics Assessment Process for the Middle Grades (MAP) Criteria for Excellence

An effective middle-grades mathematics program:

A. Uses a problem-centered curriculum

B. Engages students in a variety of learning experiences

C. Develops students as problem solvers

D. Meets young adolescents' diverse learning needs

E. Fosters positive attitudes about mathematics

F. Relates mathematical knowledge to students' interests

G. Inspires collegiality

H. Involves parents and the community

I. Continually monitors program effectiveness

Middle Grades Mathematics

Criteria for Excellence

Pre-Assessment Inquiry

Use the following pre-assessment as your team begins thinking about and examining the effectiveness of the school's mathematics program.

Listed on the next pages are nine research-based Criteria for Excellence that characterize effective middle-grades mathematics programs. Within each criterion are a list of ideals--practices that define them. The mathematics program pre-assessment is conducted by the team. Members review and discuss each ideal, asking the question:

How consistent is our current mathematics program with this ideal?

Additional information about interpreting the Criteria and Ideals can be found in Section 2 of the **MAP User's Manual**, Characteristics of Successful Middle-Grades Mathematics Programs: Criteria for Excellence.

Instructions

Working individually at first, and then as a team, members read and decide how closely they think the school's mathematics program meets each ideal. As the group evaluates the status of the mathematics program, indicate next to each ideal which one of the following best applies:

C The school's mathematics program is **consistent** with this ideal.

I The school's mathematics program is **inconsistent** with this ideal.

U I am **uncertain** as to whether the school's mathematics program is consistent or inconsistent with this ideal.

After all team members have completed their analyses individually, the team should meet to combine individual responses and reach a consensus about whether they think the current mathematics program is consistent or inconsistent with each ideal. Uncertainty should also be recorded.

This discussion enables the team to determine how to focus its assessment. Items that receive "inconsistent" or "uncertain" ratings should receive emphasis in the assessment process. To streamline the data gathering, team members may choose only to include questions in the instruments that focus on ideals they believe the school does not meet. The data gathering during the assessment will verify the team's hunches about its mathematics program, enabling the team to concentrate its inquiry in areas of known weakness.

The team co-leaders report the results of the pre-assessment to the entire faculty. Once the team determines how to focus the assessment, members proceed with the data gathering as indicated in the sections that follow in the **MAP User's Manual**.

Middle-Grades Mathematics
Criteria for Excellence

Indicate whether you think the mathematics program is *C*onsistent or *I*nconsistent with each ideal. Mark a *U* if you are uncertain.

A. CONTENT

Uses a problem-centered curriculum to develop students' conceptual understanding of mathematics, appreciation for its applications, and proficiency in computational skills.

_____1. The curriculum provides a problem-based learning context.
_____2. Mathematics problems occur in varied formats and contexts.
_____3. The curriculum content is balanced and comprehensive.
_____4. The curriculum develops number and operation sense.
_____5. The curriculum develops spatial and measurement sense.
_____6. The curriculum includes probability and statistics.
_____7. The curriculum introduces algebraic notions of variables, equations, and functions.
_____8. The curriculum emphasizes understanding of concepts and procedures.
_____9. The curriculum is research-based and responds to a changing society.

B. INSTRUCTION

Engages students in a variety of learning experiences designed to promote mathematical exploration and reasoning.

_____1. Students actively engage in mathematics.
_____2. Students discover meaning through manipulations with concrete materials.
_____3. Students learn individually and in groups.
_____4. Students construct meaning using a variety of resources and instructional materials.
_____5. Instruction makes appropriate and regular use of technology.
_____6. Instruction balances new learning, review, and homework.
_____7. Supplementary programs and enrichment activities extend mathematics instruction beyond the classroom.
_____8. Homework extends mathematics learning and applies new study skills.

C. THINKING PROCESSES

Develops students as problem solvers, critical thinkers, and effective communicators in mathematics.

_____1. Thinking processes reflect multiple strategies for problem solving.
_____2. Teachers model problem solving.
_____3. Students pose problems and discover solutions.
_____4. The curriculum develops analytical reasoning abilities.
_____5. Students and teachers discuss mathematical ideas.
_____6. Students write and talk with one another about mathematics.
_____7. Teachers clarify underlying concepts and listen to students' ideas.

D. DEVELOPMENTAL DIVERSITY

Provides instruction and resources to meet young adolescents' diverse learning needs.

_____1. All students, especially minorities, girls, and developing English speakers, have equal access to information, assistance, and classroom interaction.
_____2. Teachers use fair and flexible grouping practices.
_____3. Teachers accommodate special needs, abilities, and disabilities.
_____4. Teaching strategies motivate underachievers.
_____5. The classroom environment invites participation by all students.
_____6. Staff development and planning focus on young adolescents' needs.

E. ATTITUDES

Fosters positive attitudes about mathematics and encourages and recognizes students' accomplishments.

_____1. Teachers believe all students are capable of mathematics achievement.
_____2. Students believe they can be successful in mathematics.
_____3. Students help develop high expectations and standards for themselves and others.
_____4. The school recognizes and rewards the mathematics achievements of all students.
_____5. Originality and accuracy in mathematics are both rewarded.
_____6. Students are free to make mistakes and are encouraged to take risks.
_____7. The school encourages families to expect and support mathematics achievement.
_____8. School support personnel (counseling staff, media specialists, etc.) assist in promoting the mathematics program.
_____9. The community values mathematics achievement.

F. RELEVANCE

Relates mathematical knowledge to students' interests, experiences, and future goals.

_____1. Teachers relate mathematics to individual interests.
_____2. Imaginative uses of mathematics are stimulated.
_____3. Mathematics is applied to the arts and sciences.
_____4. The usefulness of mathematics is taught across subjects.
_____5. The program stresses the importance of mathematics in everyday life and in future career choices.

G. COLLEGIALITY

Inspires collegiality among faculty who work together to implement responsive programs for young adolescents.

_____1. The mathematics program has strong leadership and an effective, caring staff.
_____2. The school and district support teachers' continuing mathematics education.
_____3. The mathematics department conducts regular program reviews and plans in-service activities.
_____4. Interdisciplinary collaboration promotes mathematics understanding.
_____5. Administrators encourage professional involvement.
_____6. Schedules enable collaborative planning.

H. COMMUNITY

Involves parents and the community in a collaborative effort to promote student competence in developing and using mathematical knowledge.

_____1. Parents and community are involved in improving the mathematics program.
_____2. Parents are informed about the development and purposes of the mathematics program.
_____3. Parents are informed of specialized support and instructional assistance in mathematics.
_____4. Parents are informed of mathematics curriculum options and their consequences.
_____5. Parents and community participate in mathematics activities in and outside of school.

I. CONTINUING ASSESSMENT

Continually monitors student achievement, evaluates program effectiveness, and uses the results to determine the need for improvement.

_____1. Individual student achievement is evaluated by multiple sources.
_____2. Students and parents receive constructive feedback.
_____3. Assessment sources address school, district, state and national goals.
_____4. Grading policies are clearly defined and administered consistently.
_____5. The mathematics program is evaluated through multiple sources.
_____6. Teachers in all subject areas participate in program planning and evaluation.
_____7. The mathematics program coordinates with the mathematics programs in feeder elementary and receiving high schools.
_____8. The mathematics Department monitors curriculum materials for bias.

Workshop Outline 3
Understanding MAP Procedures

Purpose

To understand the process for conducting MAP.

Objectives

To develop a broad understanding of the assessment process and an overview of its key elements:

1. What's involved in conducting MAP?
2. Team membership
3. Rational for interdisciplinary involvement in mathematics improvement (see **MAP User's Manual**, Section 3, *Overview* and *Step 1.*
4. Working with Cluster Groups
5. Team members' responsibilities
6. The challenge of leading the process (Functions of Successful Change-Facilitating Teams)
7. Team roles

Resources

1. **MAP User's Manual**, Section 3: *Using Map* (entire section)
2. Promoting Successful School Change: Functions of Successful Change-Facilitating Teams - Handout 3.1

c. CATALYST/NCSU, 1991.

Transparencies

1. Seeley quote
2. What's Involved in MAP?
3. Who's Involved?
4. MAP Assessment Team
5. Professional leadership quote (from **Everybody Counts**)
6. Implementation of Innovations: Key Team Roles

c. CATALYST/NCSU, 1991.

Promoting Successful School Change:
Functions of Successful Change-Facilitating Teams

"If education is to be conceived not as a service to be delivered but as a relationship between people, the voices of its participants must be heard."

David S. Seeley (1985). Education Through Partnership. Washington, D.C.: American Enterprise Institute. p. 76.

Assessment teams will need to work together to address the kinds of intervention functions listed on the attached charts. Major responsibilities of key team members are suggested, but leadership roles will vary in different schools. Most significantly, the important leadership roles reverse in MAP, shifting from the principal to teacher leaders. The principal and central office consultants are supportive and, as much as possible, follow the lead of the teams.

Effectively functioning change teams adhere to the following nine principles:

1. Although there will be flexible sharing of team members' responsibilities, the principal is in the best position to most effectively accomplish the following key functions:

   - Sanctioning the change plan & process
   - Identifying process as a priority
   - Providing resources
   - Endorsing the position and activities of team members

2. Members of the team, collectively, through sharing and overlapping of assignments, take responsibility for other defined functions.

3. Members share a common view of the goals of the improvement process; there is clarity and agreement about the objectives and direction plans.

4. Planning occurs continuously and openly, and through a variety of means, includes all members of the team and others in the school community. All team members and staff share and discuss the plans and activities through informal conversations and regularly scheduled meetings.

5. Planning, decisions, and actions are taken with the total assessment process and potential improvement plan in mind.

6. Collegiality is a fundamental assumption, an inherent element, in all activities.

7. Because of shared communication and knowledge, the work of each team member gains from that of fellow members, resulting in a total effort that is more powerful than simple addition of individual efforts.

8. A complementary, team, i.e. one that uses all members' special strengths, along with decreased emphasis on individuals, anticipates the work to be done and collaboratively assists one another with planning and implementation.

"If education is to be conceived not as a service to delivered but as a relationship between people, the voices of its participants must be heard."

David S. Seeley (1985). ***Education Through Partnership***. Washington,DC: American Enterprise Institute, p 76.

What's Involved in MAP

Commit to Mathematics Program Change
(Approximately 3-4 days)

Faculty and Staff Decide to Conduct Assessment ♦ Faculty Co-leaders and Administrators Review Assessment Process ♦ Identify MAP Team and Consultants

Conduct Site-Based Training; Plan Assessment
(Approximately 2-4 days, throughout the assessment process)

Site Teams Participate in MAP Workshops ♦ Review Current Research ♦ Determine Data Collection Plan

Collect and Organize Data
(Approximately 3-6 days)

Work in Pairs to Collect Data ♦ Interview, Survey, and Observe ♦ Organize Information for Review by Study Groups and Team

Analyze Data and Report Findings
(Approximately 2-3 days)

Study Groups Examine and Analyze Data ♦ Identify Assets and Needs of Current Mathematics Program ♦Generate and Report Findings

Design Action Plan
(Approximately 2-4 days)

Review Study Group Findings ♦ Establish Improvement Priorities ♦Identify New or Alternative Mathematics Program Strategies ♦ Write Action Plan

Approve School Mathematics Improvement Plan
(Approximately 2-3 days)

Mathematics Department Faculty Reviews Action Plan ♦ Prioritizes Implementation Goals Into a Several-Year Plan ♦Submits Plan to Faculty for Approval

Who's Involved in MAP

Leaders

The responsibilities of the MAP team's co-leaders—a math teacher and a teacher in another discipline—include:

- Coordinating the MAP procedures, preparing recommendations for action, and directing the development of the action plan.
- Promoting schoolwide ownership and interdisciplinary involvement.
- Scheduling and convening all meetings.
- Coordinating MAP logistics.
- Coordinating and assisting the data collection, data analysis, and study group planning.
- Convening and leading designated study group meetings in the analysis and reporting of findings.
- Maintaining team records and communications.
- Keeping the school principal informed about the progress of MAP
- Facilitating smooth relationships among team members and the school's faculty and staff.

Members

The MAP team is made up of 6-12 members, usually working in three "clusters" or interest areas. Throughout MAP, members of the team share these principal responsibilities:

- Participating in training sessions and attending all team and study group meetings.
- Collecting data through interviews, observations, and surveys of students, faculty, administrators, and parents.
- Convening and leading study group meetings to analyze and report data-based findings.
- Identifying and recommending to the MAP team priorities and strategies for addressing the elements of the school's mathematics program that are inconsistent with the Criteria for Excellence.
- Contributing to the development of recommendations for action from the findings.
- Contributing to preparing the plan of action and to facilitating its implementation.
- Representing MAP to school colleagues and the community.

Study Groups

Study Groups compare the data gathered by the MAP team to the program's Criteria for Excellence and report "findings" about how the local mathematics program compares to and ideals each. Major responsibilities include:

- Reviewing and discussing the themes identified by the assessment team members from the data collection process.
- Assessing the match between the findings of the data and the Criteria for Excellence.
- Determining the "consistency" and "inconsistency" of the ongoing mathematics program in the school with MAP Criteria.
- Preparing a report of "findings," by criterion, to share the results of the data collection and analysis.
- Assisting in the long-term implementation and monitoring of the action plans.

M A P Assessment Team

Six to ten members . . working in three "clusters"

Math Cluster (MT):

- Mathematics Teachers

Interdepartmental Faculty Cluster (IF):

- Other Faculty Members

Administrative Support and Community Cluster (ASC):

- Professional Support Personnel
- Counselors & Non-evaluating Administrative Staff
- Parents or Business Partners

Ex officio Members

- Principal
- District-level Representative

One mathematics teacher and one other faculty member serve as team co-leaders.

NOTE: This arrangement is especially effective if the team uses all instruments and if the process extends a full school year. If the team decides to modify the assessment process or use only a limited number of the instruments, this structure may be adjusted.

"Implementation will require more than good will and community dialogue; it will need professional leadership of teachers operating in a transformed school environment. No one should underestimate the complexity of the challenge; effective reform will be truly difficult to accomplish."

National Research Council, *Everybody Counts* (1989), page 18.

Implementation of Innovations
Key Team Roles of Team Members

Idea Champions

Context Analyzers

Coordinators & Communicators

Support Providers

Implementation Monitors

Trouble shooters

Resource Linkers

[Eiseman, J.W., Fleming, D.S., and Hergert, L.F. The School Improvement Leader: The Role of Teams in Implementing School Improvement Plans. "Team Formation" and "Team Roles During Implementation." Andover, MA: The Regional Laboratory for Educational Improvement of the Northeast and Islands.]

Workshop Outline 4
Using MAP Assessment Tools: Overview

Purpose

To understand the MAP data gathering tools and to obtain an overview of how they will be used by the team's cluster groups.

Objectives

1. Examine the MAP Assessment Instruments and obtain an overview of how to use them for program analysis and planning.

2. Discuss the purpose of each MAP instrument and the data collection responsibilities of each cluster and study group.

3. Decide if the team will modify instruments, based upon the Pre-Assessment Inquiry, or adjust the overall assessment process to accommodate particular school site questions or requirements.

4. Modify, if necessary, the general MAP work flow and cluster and study group analysis process. Determine the time line for implementing the assessment and action planning.

Resources

1. **MAP User's Manual**: Section 4, especially *Using the Assessment Tools; Collecting Data; Conducting Interviews; Organizing and Summarizing Data for Group Review.*

2. **MAP User's Manual**: Appendices 1 and 2, *Making Logistical Decisions: Questions to Consider* and *Scheduling Matrices.*

3. **MAP Assessment Instruments** - separated by Cluster group; copies of appropriate instruments for each team member.

c. CATALYST/NCSU, 1991.

Transparencies

1. Study Group Data Analysis Framework
2. Assessment Team Work Flow
3. MAP Logistics Time Line

c. CATALYST/NCSU, 1991.

Study Group Data Analysis Framework

Cluster or Study Group	Instrument (Abbreviation)	Who Responds?
Mathematics Teacher (MT)Cluster	◆ Mathematics Teacher Interview (MTI)	◆ Mathematics Teachers
	◆ Mathematics Classroom Observation (MCO) and Observation Feedback (OBF)	◆ Team Member Observers of Mathematics Classrooms
	◆ Mathematics Teacher Survey (MTS)	◆ Mathematics Teachers
Interdepartmental Faculty Cluster (IF)	◆ Administrator Interview (ADM)	◆ Administrators
	◆ Faculty Interview (FI)	◆ Other School Site Faculty and Professional Support Staff (e.g., Counselors, Librarians, etc.)
	◆ School-Wide Observation of Mathematics Related Activities (SWO) and Observation Feedback (OBF)	◆ Team Member Observers of Non-Mathematics Classes
Administrative Support and Community Cluster (ASC)	◆ Parent Interview (PARI)	◆ Parents, Community Members
	◆ Student Interview (STI)	◆ Students
	◆ Mathematics Materials and Facilities Survey (MFS)	◆ Assessment Team
	◆ Statistical Profile (SP)	◆ Assessment Team

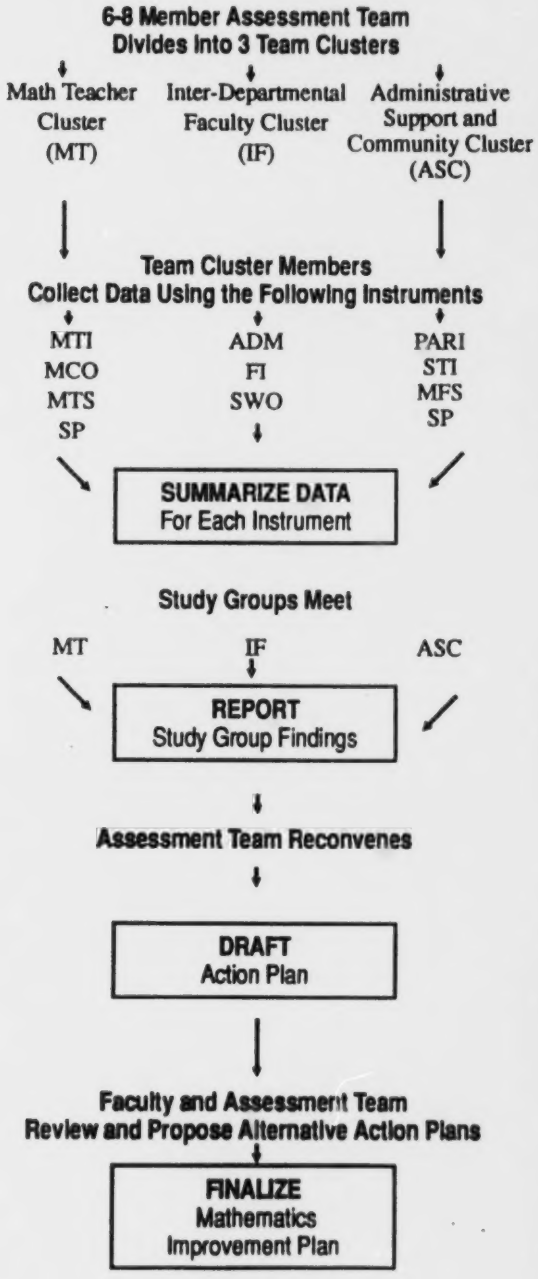
INTERVIEWS:
Mathematics Teacher Interview (MT)
Administrator Interview (IF)
Faculty Interview (IF)
Parent Interview (ASC)
Student Interview (ASC)

OBSERVATIONS:
Mathematics Classroom Observation (MT)
School-Wide Observation of Mathematics-Related Activities (IF)
Observation Feedback Form (MT and IF)

STATISTICAL PROFILE:
(Assessment Team)

SURVEYS:
Mathematics Teacher Survey (MT)
Mathematics Materials and Facilities Survey (MT and ASC)

Assessment Team Work Flow



Assessment Team

- Informs faculty about Assessment
- Participates in training to use MAP
- Organizes in team clusters to collect data
- Demonstrates interview and observation processes to colleagues
- Coordinatedwith the school administration and the district office

Team Cluster Members

- Collect data
- Summarize data from interview, observation and survey instruments
- Lead Study Groups in data analysis process (below)

Study Groups

- Analyze each data summary
- Identify consistency and inconsistency with ideals
- Report Study Group findings to the Assessment team

Assessment Team

- Reviews and analyzes the Study Groups' findings
- Summarizes and prioritizes all findings
- Designs Action Plan
- Distributes proposed plan to faculty for discussion

Faculty and Assessment Team

- Review and discuss Assessment team's action plan
- Faculty proposes alternative plans
- Faculty and team agree upon and prioritize actions
- Faculty and team finalize the school's Mathematics Improvement Plan

MAP Logistics Time Line
Target Dates For Completing Major Activities

MAP Team Activities	Target Completion Dates
▪ Inform Faculty And Community	_____
▪ Select Team Members	_____
▪ Conduct Workshops For Team To Learn To Use Map	_____
▪ Conduct Interviews And Observations	_____
▪ Staff Completes Surveys	_____
▪ Team Members Complete Data Summaries	_____
▪ Study Groups Examine Findings	_____
▪ Study Groups Report Findings To Team	_____
▪ Team Combines Findings Of Study Groups & Determines Priorities For Action	_____
▪ Team Generates Preliminary Strategies for Program Improvement & Action Plan	_____
▪ Team Distributes Preliminary Action Plan	_____
▪ Faculty Discusses Findings And Action Recommendations	_____
▪ Team Finalizes the Action Plan	_____
▪ Faculty Adopts Action Plan	_____
▪ School Presents Plan To Central Office & Begins Implementation	_____
▪ School Disseminates Action Plan To Community	_____

Workshop Outline 5
Using MAP Interviews and Surveys

Purpose

To learn to use the MAP interview and survey instruments, and to plan and organize the logistical procedures for using them.

Objectives

Interviews

1. Emphasize that the purpose of the MAP interviews is to provide the entire school community--the mathematics department as well as other faculty, students, and parents--a voice in the assessment.

2. Review the purpose of each instrument and its relationship to the larger goals of the assessment. Consider, especially, the results of the team's pre-assessment, and determine which items in each instrument, if any, should be modified or deleted.

3. Introduce standard procedures for conducting interviews.

4. Using the recommended procedures, practice conducting interviews through role play and trial sessions with fellow team members.

5. Examine the logistical requirements for conducting interviews (e.g., who will interview whom, the format, and time lines), and agree upon procedures the team will use in completing this component of the assessment.

Surveys

1. In the instrument volume, examine the two surveys (Mathematics Teacher Survey and Mathematics Materials and Facilities Survey) and the School Statistical Profile so team members fully understand the content and purpose of each.

2. Review instruments and designated cluster responsibilities, and make decisions about the best approach in your school to conducting and using these surveys. (Note: For the surveys, the MAP directions suggest the team share the responsibility across clusters for data collection. Practicality and time will affect how extensively these instruments are used by your team.)

3. Determine which colleagues and associates will complete each of the surveys and the Statistical Profile sheets, which team members will initially summarize the data, and the time lines for completing the survey instruments.

c. CATALYST/NCSU, 1991.

Resources

1. **MAP User's Manual**: Section 4, especially *Conducting Interviews*; *Organizing and Summarizing Data for Group Review.*

2. **MAP User's Manual**: Appendix 1, *Making Logistical Decisions: Questions to Consider*

3. **MAP Assessment Instruments** - separated by Cluster group; Appropriate instruments for each team member.

Transparencies

1. Interviewing Tips

2. ***Transparencies from Workshop 4 that may be useful, especially:***

Transparency 4.1	Study Group Data Analysis Framework
Transparency 4.2	Assessment Team Work Flow

MAP INTERVIEWING TIPS

- Be familiar with the questions.
- Explain the purpose of the interview.
- Be natural and honestly friendly.
- Allow the interviewee time to reflect.
- Seek clarification when necessary.
- Stay on the topic.
- Maintain eye contact with the speaker.
- Avoid giving your personal opinions or reactions to questions.
- Be an active listener, listening closely for important ideas and the speaker's meaning.
- Listen with an open mind.

Workshop Outline 6
Conducting Map Observations

Purpose

To learn to use the MAP observation instruments and to plan the logistical procedures for conducting mathematics classroom and schoolwide observations.

Objectives

1. Understand the importance of conducting classroom observations in mathematics classes (using the Mathematics Classroom Observation) ***as well as*** in other classes (using the Schoolwide Classroom Observation).

2. Reinforce that the goal is to develop colleagues' comfort with the process so that, in time, most of the faculty will use observations as a means for understanding the connections in classroom practices throughout the school.

3. Suggest ways to engage ***all*** teachers in the observations so the staff develops trust for the process and fully participates in this essential component of the assessment.

4. Review techniques and procedures for conducting classroom observations in a collegial, supportive manner.

5. Practice and develop observation skills through role play and trial sessions using the MCO and the SWO in team members' classrooms or with videotapes of teaching that may be available in the school or district professional resource library.

6. Candidly explore the potential obstacles to the success of this aspect of the study, and consider how best to convey to all faculty the usefulness of the observation process to colleagues from all departments in the school.

7. Plan the logistics of conducting observations.

c. CATALYST/NCSU, 1991.

Resources

1. **MAP User's Manual**: Section 4, *Conducting Observations, Making Logistical Decisions*, Appendix 2, *Scheduling Matrices*.

2. Videotapes of teaching that can be obtained from within the school or the school district's resource library. The Association of Supervision and Curriculum Development (703/549-9110) has available for rent or purchase videotapes of teachers at work, as does the Cuisenaire Company of America (800/624-0822).

3. Observation directions from the cover sheets of each observation form (MCO & SWO).

Transparencies

1. Observation Tips

2. ***Transparencies from Workshop 4 that may be useful:***

Transparency 4.1	Study Group Data Analysis Framework
Transparency 4.2	Assessment Team Work Flow

c. CATALYST/NCSU, 1991.

OBSERVATION TIPS

- Understand the criteria and ideals to assure your observations reflect the meaning and intent of the context observed.
- Place yourself in the classroom so you can observe both the students and the teacher easily and fully.
- Become accustomed to the room and its activity before recording observed items.
- Go beyond your biases, recording only what you actually see or hear, avoid making judgements on the basis of your initial reactions or on your personal preferences of style or approach.
- Watch people closely, observing and noting their expressions and the meaning behind their actions.
- Listen for the meanings and ideas exchanged among the students and the teacher, and record them accurately.
- Look beyond surface behavior.
- Focus on what is observed, not what is missing.
- Arrange a time and place for a debriefing session.

Workshop Outline 7
Summarizing Data Within Cluster Groups

Purpose

To consider various ways of summarizing information from individual instruments in preparation for analyzing data by cluster group.

Objectives

1. **Review** the three types of **instruments**--interviews, surveys, and observation forms--and the analysis approaches required for each.
2. Discuss **alternative methods for summarizing interview data** and the advantages or disadvantages of each approach.
3. **Reach a team consensus** on the procedure the team will to use to summarize its interview data.
4. Discuss plans for **tallying the surveys and observations**.
5. Determine a time line and plan for completing the initial data summary.

Resources

1. **MAP User's Manual**, Section 4, *Organizing and Summarizing the Data for Study Group Review.*
2. Sample interview transcripts (Handout 7.1) or completed interviews, observations, and surveys for preliminary analysis.
3. Notebook paper, note cards, chart paper, markers and other materials, as needed, for planning the data collection process.

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Resources (cont.)

4. Copies of the *Criteria and Ideals Cross-Reference List* from the final section of the **MAP Assessment Instruments** volume.

5. Handouts listed below.

Handouts

7.1 Alternative Methods of Summarizing Data

7.2 Transcript of Sample Interview Responses

7.3A Sample Tally Interview Summary Sheet: By Ideal

7.3B Interview Summary Sheet: By Ideal

7.4A Sample Interview Summary Sheet: By Interview Instrument

7.4B Interview Summary Sheet: By Interview Instrument

7.5 Partially completed Cross-Reference Worksheet

7.6 Sample Tally Sheet for Observations:
Mathematics Classroom Observations and Schoolwide Observations of Mathematics-Related Activities

When the data gathered from all assessment instruments have been completely summarized within each cluster, Phase 1 of the data collection is complete. Workshop 8 suggests procedures to use in the next phase of the analysis process.

Alternative Methods of Summarizing Data Phase I

The following are suggestions for summarizing MAP data from all team members' instruments. This is Phase I of MAP analysis, and it is used to consolidate the findings of individual members with the findings of others in their cluster.

After all data have been collected and initially summarized by ideal within cluster groups, groups will pool data across clusters and determine how the information will be used in action planning. Workshop 8 will detail Phase 2 of data analysis.

Interviews

The following discussion outlines options for summarizing data from assessment interviews. Team members should feel free to explore and propose modifications to this approach or to offer alternatives that the group prefers. Data analysis is a creative process, one that is unique to each analyst. Thus, it is rare that a standardized procedure works for everyone.

The most important aspect of this phase of the analysis is to determine a meaningful note-keeping strategy for team members to use in summarizing and reviewing the assessment results. At the end of this phase of the analysis, the interview data will be consolidated so its implications can be accurately interpreted by team members and used for action planning. The team should select the most practical way to record the consistency or inconsistency of all respondents' answers with each Ideal.

Which ever analytical method is chosen, we suggest that cluster groups create separate notebooks or folders for each group of interview instruments they are summarizing. Decide if the team wishes to summarize data by Ideal, or by interview instrument.

This workshop includes transcripts of sample interviews with parents, teachers, and administrators (Handout 7.2). The samples can be used by the team to practice evaluating and recording interview data as described below. Alternative #1 analyzes data by ideal, using the model demonstrated in Handout 7.3A and B; Alternative #2 summarizes data by interview, as demonstrated in Handout 7.4A and B.

Alternative #1: Notes and Comments by Ideal

This method of analysis uses one worksheet ***for each Ideal***. Before beginning the analysis, team members should prepare a complete set of recording sheets such as the one modeled in Handout 7.3. Handout 7.3A uses the sample interview data from Handout 7.2 to provide an example of the analysis and recording procedure described below.

A. As soon as possible after each interview, team members review interviewees' responses to each question and summarize them on Ideal summary sheets.

B. Begin by confirming which Ideal(s) each response addresses. Each interview question is keyed to a pertinent Ideal, but it is quite possible that a person's open-ended response may relate to a different Ideal, or to more than one. Record responses accordingly.

C. Decide whether each response shows that the mathematics program is uncertain, inconsistent, or neutral with respect to the pertinent Ideal(s) and mark the appropriate column. When you think it would be useful, record in the Comments area of the Summary Sheet a short note that reflects interviewees' statements.

D. After all interview data have been summarized, tally the percent of responses indicating the program's consistency or inconsistency with each ideal. Record the summaries for cluster groups on a Criteria and Ideal Cross-Reference Worksheet (Handout 7.5, and at the end of MAP instrument volume).

Alternative #2: Response Tallies by Instrument

This approach uses the Interview Summary Sheets similar to those described above. However, instead of recording notes and comments by Ideal, maintain records by ***instrument***, as shown in Handout 7.4A and 7.4B. This will require the additional later step of summarizing of data *across instruments* for each Ideal, but it may be a more efficient process initially.

After all interviews have been summarized, tally the results by Ideal on blank Cross-Reference Worksheets (Handout 7.5, and at the end of MAP instrument volume).

Once all interviews have been summarized, determine a total of consistent or inconsistent remarks made for each Ideal. Although neutral or uncertain remarks do not necessarily reflect an inconsistency in the mathematics program, for ease of analysis they should be either be dropped from the tally or included with the inconsistent responses. In the long run, this will clarify the final determination about areas that are clearly successful and those that require additional focus.

Observations

To **tally the observations**, first total the number of times each team member observed and recorded the events listed in the MCO or SWO. Submit these subtotals to the team leader to obtain a grand total. Team leaders should designate one or more individuals to keep the "grand total" of tallies for <u>each</u> of the two kinds of observations,

Mathematics Classroom Observations (MCO) and Schoolwide Observations (SWO). Record grand totals on master sets of MCO and SWO forms, using one form to summarize all observations. Follow this summary procedure:

A. Individual observers first determine the total number of tally marks for each item across all observations he or she conducted. This results in a summary of the number of times every item was marked by each observer.

B. Individual observers carefully note how many ***total observations*** they conducted.

C. Next, submit individual totals to the recorders who are keeping the "grand total" on master sets of observation forms, making sure also to record and report the total number of observations conducted by every observer along with the observation item totals.

Suggestion: Remember, the objective of the analysis is to obtain an accurate summary of the total number of times each item was observed over a total number of observations conducted by all team members during the assessment period. There is no need to maintain individual observer records.

D. After all items have been summarized on master sets of the MCO and SWO, designated team members should determine the percentage of times that each individual item was tallied across all observations. These data can be readily summarized on a computerized spread-sheet, created for this purpose.

Suggestion: This is a good time to turn to students to assist with MAP. Calculating percentages (using hand-held calculators or computer spread sheets, of course) is an ideal small group classroom activity for students. This is also a fine way to include students in this exploratory process.

Surveys

Survey data, like observation data, should also be tallied across all instruments, and it is probably most easily summarized by a pair of team members working together with a set of master forms to obtain "grand tallies" for the entire cluster. Using a single blank form for recording data from each of the surveys, tally across all the instruments cluster members used, and record relevant notes and comments.

These data, together with the interview and observation data, will be used by the Cluster or the Study Groups as additional information to guide action planning.

Sample Materials for Practicing Data Analysis

(To accompany Workshop 7)

The worksheets on the following pages are examples the team may use to practice analyzing interview and observation data within cluster groups. Duplicate these samples as needed.

7.2 **Transcript of Sample Interview Responses**

7.3A **Sample Tally Interview Summary Sheet: By Ideal**

7.3B **Interview Summary Sheet: By Ideal**

7.4A **Sample Interview Summary Sheet: By Interview Instrument**

7.4B **Interview Summary Sheet: By Interview Instrument**

7.5 **Partially completed Cross-Reference Worksheet**

7.6 **Sample Tally Sheet for Observations: Mathematics Classroom Observations and Schoolwide Observations of Mathematics-Related Activities**

Transcript of Sample Interview Responses

SAMPLE RESPONSES FROM PARENT INTERVIEWS

PARI #1. *Many groups in society say schools should update the mathematics they teach to students in the middle grades. They say there should be less memorizing and drill work and more practical uses of mathematics, problem solving, and critical thinking. How do you feel about this? (Ideal A-1)*

1. I agree wholeheartedly. Now Dwayne is finally learning a little math at school, and I am working with his teacher. Together, we are helping him see how the math ideas he understands at home translate into the problems he has at school. He understands math when there are things he is interested in. His teacher shows him how to do math with things that are tangible, things he can touch, count, or demonstrate. This helps a lot.

2. The drill and practice stuff she takes home makes both me and my daughter miserable and makes her detest math so much. She can't see the practicality of it, so she has totally blocked out that math can be useful to her. She can use a calculator and does math well at home but at school she does terribly; it's punishment for her.

3. That sounds like what they said in the 60s and 70s -- all the "new math." I don't know. I think the basic skills are all you really need; they're all I have ever needed, and it seems to me that the school is doing a decent enough job of teaching them. They don't have a lot of frills.

4. I agree and I think they should teach more critical thinking skills in the school because it gives students the chance to develop ideas on their own. My daughter does better when she can think things out for herself.

5. I think it's a good idea.

PARI #2. *How does our community -- businesses, clubs, governmental agencies, etc. -- demonstrate that it is important for students to learn mathematics? (Ideal E-9)*

1. I don't think they do. I've never known that business has an influence on the school's mathematics program; not my kid's, anyway.

2. The community doesn't show any interest at all and I don't think they are doing enough because my daughter is still asking why she needs math if she is not going to work in a math-related area. No one is showing her how math skills are needed in all occupations, even those that are not directly mathematical.

3. I can't think of any at all.

4. Well, yes, they really have gotten involved. In fact, I think they are involved too much. They are pushing the schools around. In my daughter's pre-algebra class there is a scientist helping and I don't like the hard line competition he promotes, or the reward/punishment system the teacher has let him set up.

5. I don't know.

PARI #3. How are parents and the community involved in improving the mathematics program? (Wait for response.) What could the school do to involve them more? (Ideal H-1)

1. They are not. (With a prompt.) I think you could have an open house just for the math department to explain what the school is teaching. Also, if there are parents who use math in their occupation, they can come in and talk about how they use it in their work.

2. Not at all, that I know of. But since they involve us with helping kids with homework, I do wish they would send home work that is non-threatening, something fun, something real. Nothing is coming home that looks like that right now. So far I've only been asked to help my kids memorize the times tables, and I think that is a stupid task; there are better ways to learn the tables!

3. I don't know how they're involved. That's the teachers' job, anyway.

4. Well, the parents in this school have really gotten pretty involved in math. A group of parents have helped get our computer lab together. Some even have donated their own computers and software; others teach kids the ways the computer is used in their work. My daughter has learned a little about bookkeeping and accounting this way, and she is asking some questions about getting the jobs accountants do.

5. They aren't involved. (Prompt- How do you feel about that?) I think the school should bring parents out more. There are lots of parents in my neighborhood and in the community who are not aware of the importance of math. Maybe parents who are not so familiar with the use of math could get together with the other parents who know why it is so important to explain why their kids need math in their daily lives. That would help parents get behind their kids more.

SAMPLE RESPONSES FROM MATHEMATICS TEACHER INTERVIEWS

MTI #6. Which do you think is more important, skills or applied problem solving and why? (Ideal A-1)

1. I think basic skills are more important, because that is what is tested. Personally, I enjoy using problem solving and applications to teach math, but that is just not expected here at this school or in this district, so I emphasize drill work and use applications as enrichment.

2. I think the emphasis should be on applied problem solving and that is what I like to teach. Since there is so much emphasis on test scores, however, I keep quiet about it. I think this NCTM stuff is good, because it will let me "come out of the closet" about what I most love to teach.

3. I try to balance, but, the truth is, the skills come before playing around with fun problems, don't you think? We have to keep pushing on the test scores because we are still doing so poorly, but, possibly a different approach will get us off dead center. I really don't know, to be honest.

4. Finally, we are acknowledging how our misdirected drill and kill approaches are hurting us. But the talk is easy; changing what we do is not so easy. I personally would like to teach very differently, but it is not the way allot of others or the administration prefer, so I go with the crowd. When I can, I work problems in to the curriculum, but I do place emphasis on drill and practice. Everyone's happy that way. Why argue with something that works!

5. I do lots of problem solving and applications, and from that we drill and memorize the basics required for tests. However, I think my approaches are seen as a little strange. It works for me, though, and I think it works for my kids. We know from the tests that my kids are competitive with the others!

SAMPLE RESPONSES FROM ADMINISTRATIVE INTERVIEWS

ADM #9 *Schools have been called upon the update the mathematics that has been traditionally taught to students in the middle grades. It is said, in particular, that memorizing and drill work should receive less emphasis in favor of more problem solving, critical think, and mathematics applications. How do you feel? (Ideal A-1)*

1. Well, to be honest, I think it is all important, but I do not know how to suggest to teachers that they do it all. We assign lots of problems for students to solve, but, from what I can tell, NCTM is talking about something different. I'd like to see more emphasis on the NCTM-recommended teaching--open-ended problems and the like--but that is just not how we've been instructed from downtown. Parents want memorizing; the curriculum is drill-oriented; tests expect memorizing and speed; so, of course, teachers encourage memorizing. Still students continue to have difficulty in math, and they don't like math either. So, maybe a different approach would be better. Possibly we should make a change, but that will take some time.

2. You know, I am real concerned we do not find ourselves back in the dilemma of the 60s, with all that new math. Problems are important, sure, lots of problems. But the drill is absolutely necessary as a basis of so-called critical thinking and math applications. I do not think you can have one without the other, but I vote for skills first and that's what our teachers are doing, too.

INTERVIEW SUMMARY SHEET: BY IDEAL

IDEAL: A1 - THE CURRICULUM PROVIDES A PROBLEM-BASED CONTEXT FOR LEARNING

NUMBER OF INTERVIEWS: 12
% CONSISTENT: 3/12.5%
% INCONSISTENT: 8/33%

INSTRUMENT	QUEST'N NUMBER	CONSISTENT	INCONSISTENT	UNCERTAIN	COMMENTS
PART	1	1	III	1	PARENTS' VIEWS ARE split; Comments suggest math is drill & practice - oriented
MTI	6	II	II	1	TEACHERS' philosophies CONTRAST sharply - EMPHASIS is on skill drill first, problem-solving second
ADM	9		II		ADMINISTRATORS support basic skills, but may be willing to look at ALTERNATIVES with a problem focus

INTERVIEW SUMMARY SHEET: BY IDEAL

IDEAL: A1 - THE CURRICULUM PROVIDES A PROBLEM-BASED CONTEXT FOR LEARNING

NUMBER OF INTERVIEWS: ____
% CONSISTENT: _____
% INCONSISTENT: _____

INSTRUMENT	QUEST'N NUMBER	CONSISTENT	INCONSISTENT	UNCERTAIN	COMMENTS

INTERVIEW SUMMARY SHEET: BY INSTRUMENT

INSTRUMENT: PARENT INTERVIEW

NUMBER OF INTERVIEWS: 15
% CONSISTENT: 3/20%
% INCONSISTENT: 10/67%

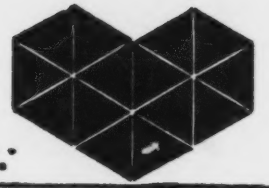
CRITERIA & IDEAL	QUESTION	CONSISTENT	INCONSISTENT	UNCERTAIN	COMMENTS
	Is There				
A-1	Less drill; more problem solving?	/	///	/	Parents want more problem-solving, but current program emphasis drill + memory
E-9	Community demonstrates importance of math?	/	///	/	Business is rarely visible. One case where they are, the parents don't like it.
H-1	Parent involvement in math?	/	////		Most parents not involved; one works with computer. Some interest + willingness to become more involved

INTERVIEW SUMMARY SHEET: BY INSTRUMENT

INSTRUMENT: _____

NUMBER OF INTERVIEWS: ____
% CONSISTENT: _____
% INCONSISTENT: _____

CRITERIA & IDEAL	QUESTION	CONSISTENT	INCONSISTENT	UNCERTAIN	COMMENTS
59					



Sample Data Summary

CRITERIA AND IDEALS: CROSS-REFERENCE WORKSHEET

Key: Consistent Responses / Incon-sistent Responses

These worksheets may be helpful in keeping summary records of data you collect. Use them in any way you wish.

A. CONTENT	MTI	ADM	FI	PARI	STI	MCO	SWO
A1. The curriculum provides a problem-based context for learning.	2 / 2	/ 2		1 / 2		* 31% Consistent	** 42% Consistent
A2. Mathematics problems occur in varied formats.							
A3. The curriculum content is balanced and comprehensive.							
A4. The curriculum develops number and operation sense.							
A5. The curriculum develops spatial and measurement sense.		MATH CLUSTER	- MCO/MTI				
A6. The curriculum includes probability and statistics.		FI CLUSTER	- ADM/SWO				
A7. The curriculum introduces algebraic notions of variables, equations, and functions.		ASC CLUSTER	- PARI				
A8. The curriculum emphasizes understanding of concepts and procedures.							
A9. The curriculum is research-based and responds to a changing society.							

* MCO 14, 15, 38, 39 ** SWO 1, 2, 3, 4

Sample Tally Sheet for Observations

MATHEMATICS CLASSROOM OBSERVATION

GRAND TOTALS

N = 24

IDEALS	INSTRUCTIONAL PROCESSES *Mark If Observed*	1 2 3 4 5 6 7 8 9 10	TOTAL
	14. Teacher's talk includes questions like the following (mark those that apply):		# / %
[C-1]	a. Are there other valid solutions to this problem? What might be a different approach or strategy?	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	6 / 25%
[C-4]	b. Have we made an error here? Can you find my mistake?	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	3 / 12.5%
[C-5]	c. What do you think? Why do you think that? How did you arrive at your answer? How can you prove to us that you are correct?	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	10 / 42%
[C-2]	15. Teachers use estimation and/or hypothesis testing as tools.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	8 / 33%
[C-4]	16. Teachers help students take accurate notes, pose questions, organize materials, and in other ways improve their analytical skills.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[C-5]	17. In their discussions, students and teachers use correct mathematical language in appropriate ways.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[C-6]	18. Students give oral or written evidence of mathematical experiments, discoveries, processes, and/or strategies.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	

More open-ended questions are needed?

[C-3]	38. Students develop their own ideas, strategies, and/or mathematical rules or procedures.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	2 / 8%
[C-3]	39. Students invent problems, discover solutions, or engage in mathematical games.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	3 / 12.5%
[C-6]	40. Students discuss each others' logic and/or problem-solving methods and mathematical strategies.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[E-3]	41. Students help develop classroom expectations, rules, and procedures.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[G-1]	42. Teachers demonstrate understanding of the mathematical concepts they are teaching.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[H-5]	43. Parents and/or community representatives are visible partners, working with students in mathematics activities and programs.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____

More student-initiated problem solving needed

SCHOOLWIDE OBSERVATIONS OF MATHEMATICS-RELATED ACTIVITES

Observer Grand Total
N = 48 observations

Instructions

*To ease the recording of your observations, the checklist on the following pages has been divided into two sections. The first section includes items describing **general instructional processes and characteristics of the classroom environment**. They should be marked as they are observed—while you are in the classroom. The second group of items includes **mathematics-related items** that you can mark towards the end of the observation or immediately after you have left the classroom. Mark each item only once, regardless of how many times you observe it.*

SECTION I: General Instructional Processes and Characteristics of the Classroom Environment

Mark these items as they are observed. Mark each item only once, regardless of how often it is observed.

IDEALS	Instructional Processes & Classroom Environment *Mark If Observed*	1 2 3 4 5 6 7 8 9 10	#/% TOTAL
[B-1]	1. Students are involved in projects that require their active intellectual engagement.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	21/44%
[C-1]	2. Teachers require students to apply critical thinking in the completion of assignments.	greater % of problem solving in other ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	17/35%
[C-2]	3. Teachers use open-ended questions or demonstrate problem-solving strategies in their subject areas.	classes than in ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	15/31%
[C-3]	4. Students pose problems and discover solutions.	math. Still ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ 15	29/60%
[C-6]	5. Teachers in various content areas encourage students to invent, write, draw, or describe their thinking and procedures.	NOT ENOUGH. ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[C-6]	6. Students participate in problem-solving activities that enable them to discuss one another's logic or thinking in an honest, sensitive manner.	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	____
[C-7]	7. Teachers' talk in various content areas includes comments and questions like the following (mark those that apply)		

An Introduction to Workshops 8 and 9
Completing the Assessment Process

"The complete analysis isn't."

*Patton, M. Q. (1983). **Qualitative evaluation methods**. Beverly Hills, CA: Sage Publications. p. 295.*

For the past several months, the MAP team has engaged in a major evaluation effort. It has used the evaluator's best tools -- interviews, surveys, and observations -- to gain a clear view of the mathematics program in its schools. Now, nearing the final stages of the process, the analysis and action planning begin.

No doubt, team members are challenged by the sheer volume of information they have generated. Sitting down to assess the pages of information, text, and numbers can be overwhelming. The next two workshops are designed to simplify the process and keep the team focused on the goal of designing an action plan for updating and improving the mathematics program in the school.

As you and your fellow team members conduct the analyses and write the action plan, keep in mind that data analysis and program design are never easy tasks. They require creativity, hard work, and sustained commitment. Moreover, no two people go about the process in exactly the same way. As a result, the suggestions in the following workshops are guidelines; they are not intended to be prescriptive. It will, finally, be up to the team to determine the procedures and approaches that are most suitable for their data, their working style, and their school.

*The major resources for planning are the **MAP User's Manual**, the data gathered using the MAP Assessment Instruments, and Workshops 8 and 9, which follow this introduction. Working together, team co-leaders and colleagues will learn how to analyze and evaluate data as they do it. The step-by-step directions, Analyzing Data Across Cluster Groups (Workshop 8) and Completing Action Plans (Workshop 9), make the process as simple as possible.*

In addition, the school and district have powerful human resources to assist. Team members, central office personnel, and school site administrators can be very effective facilitators and rich sources of information. Call upon them to help solve practical planning problems and to find innovative alternatives to lingering challenges.

This introduction concludes with a list of several books about planning school improvement efforts and conducting practical evaluations. These resources were used in developing the workshops that follow. Some team members may find them of value as they work through the data analysis and planning.

c. CATALYST/NCSU, 1991.

Finally, as the group completes its assessment, keep in sight the wisdom of master evaluator Michael Q. Patton. He notes the following principles that managers and executives in Fortune 500 Corporations adhere to when creative thinking is called for (Patton, 1987, p. 248.). They work beautifully in schools, as well.

- *Be open*
- *Generate options*
- *Divergence before convergence*
- *Use multiple stimuli*
- *Sidetrack, zigzag, and circumnavigate*
- *Change patterns*
- *Make linkages*
- *Trust yourself*
- *Work at it*
- *Play at it*

*Patton closes his own book, **Creative Evaluation**, with the words of this Evaluation Utilization Anthem, sung to the tune of Auld Lang Syne (Patton, 1987, p. 255):*

May all the data not be forgot
And simply left to rot;
Oh, take a look every now and then,
And see what you have got.

Chorus:

Yes, see what you have got,
Oh, see what you have not,
We'll drink a cup of kindness then
And see what the program has wrought!

SING OUT, MAP TEAM. GOOD LUCK!

References

Patton, M.Q. (1987). Creative evaluation (Second Edition). Beverly Hills, CA: Sage Publications.

Patton, M. (1983). Qualitative evaluation methods. Beverly Hills, CA: Sage Publications.

Saxl, E.R., Miles, M.B., and Lieberman, A. (1990). Trainer's manual. Assisting change in education (ACE): A training program for school improvement facilitators. Alexandria, VA: Association for Supervision and Curriculum Development.

Smith, S.C., and Scott, J.J. (1990). The collaborative school. Reston, VA: National Association of Secondary School Principals.

c. CATALYST/NCSU, 1991.

Workshop Outline 8
Analyzing Data Across Cluster Groups

Purpose

To complete the analysis of MAP data across cluster groups and determine Ideals for action planning.

Objectives

1. Cluster groups review data to determine the consistency of the mathematics program with MAP Criteria for Excellence.
2. Identify program strengths and determine Ideals for priority action from three perspectives: the Mathematics Teacher Cluster (MT), the Interdepartmental Faculty Cluster (IF), and the Administrative, Community, and Support Cluster (ASC).
3. Summarize program strengths across cluster groups.
4. Define mathematics program strengths and Ideals for priority action across cluster groups.

Resources

1. **MAP User's Manual**, Section 4, *Reporting Preliminary Findings* and *Summarizing Cluster Group Findings*.
2. Interview summary sheets and other cluster group summaries that were completed in Data Summary - Phase 1
3. Paper, pencil, chart paper and/or chalk board. Some groups may also find computer and duplicating facilities useful.
4. Copies of the Criteria and Ideals Cross-Reference List and the Cross-Reference Worksheet from the MAP Assessment Instruments volume.
5. Worksheets (see list on the next page).

Worksheets

8.1 Consistency/Priority Rating Summary

8.2 Decision Matrix

8.3 Program Strengths/Needs Summary

8.4 Action Planning Guide - Part I

Instructions for Analyzing MAP Data Across Cluster Groups

This handout explains how to analyze the results of the MAP assessment. It begins with cluster groups working separately to determine action planning priorities. Once the action priorities are established within clusters, the data are combined across clusters.

There are two parts to analyzing the data across cluster groups:

- Each cluster group identifies its recommended program strengths and priorities for action, and
- The team determines program strengths and priorities for action across clusters.

Suggestion: Refining and re-examining data can appear to be a never-ending process. Thus, it is important to put a reasonable boundary on the analysis and action planning by committing to deadlines and completion dates from the beginning. Deadlines help planners focus, be creative, and work steadily. Moving forward efficiently, setting aside lingering debates and disagreements when possible, will help quicken the planning pace. In the long run, a limited number of concentrated planning periods will reveal a clear picture of the current program and a practical, workable consensus for action will come more quickly.

In preparation for the first part of the analysis, each cluster group gathers the following materials:

- Completed interview item summary sheets and observation and survey summaries (from Workshop 7).
- Criteria and Ideals Cross-Reference Worksheets (from the MAP Assessment Instruments volume)
- Consistency/Priority Rating Summary (Worksheet 8.1)
- Decision Matrix (Worksheet 8.2)

In preparation for the second part, the team will need the following two completed worksheets from each of the three cluster groups' Decision Matrixes.

- Program Strengths/Needs Summary (Worksheet 8.3)
- Action Planning Guide - Part I

Part I:
Cluster group identification of program strengths and priorities for action.

Reminder: Work within clusters to complete these tasks.

Step 1:
Decide the degree of the mathematics program's consistency with each MAP Ideal.

a. Have available a copy of the **Criteria and Ideals Cross-Reference List** and **Worksheet**, from the final section of the MAP Assessment Instrument volume, and all summarized data

b. A designated recorder begins by reading the Ideals aloud from the **Cross-Reference List**, along with the item numbers on the instruments. The cluster members locate the appropriate question(s) in their instrument summaries and read the tally for that Ideal to their group. Compute across instruments the percentages of consistent and inconsistent responses. Use the ideas that are common across items and instruments to determine the consistency level of responses to any particular Ideal. Decide how to balance contradictory results that are likely to occur across instruments and among different groups interviewed.

Assign each Ideal a consistency rating with the combined information from each instrument. Use a 1 to five rating, according to the following scale:

5 = Completely consistent with the Ideal

3 = Moderately consistent with the Ideal

1 = Inconsistent with the Ideal

If percentages are computed, interpret the ratings as numerals and divide by two (2) to determine the consistency rating. For example, if an Ideal received a consistency rating in percentages of 80% to 90 %, the final rating would be between 4 and 4.5. If 42% percent of responses were consistent with the Ideal, the consistency rating would be 2.1. Round the ratings down at .5, giving these examples ratings of 4 and 2 respectively.

c. Record the agreed-upon consistency rating in the left margin of the **Cross-Reference Worksheet** (from the MAP Assessment Instruments). Use the blank space in the worksheet to record relevant notes from the data that may help in the action planning stage.

d. Continue to determine the consistency or inconsistency of every Ideal until the group has decided and recorded all results for their cluster on the Cross-Reference Worksheet.

e. Once each cluster determines the consistency rating for all Ideals assessed by their group, transfer Ideal ratings onto Handout 8.2, the **Consistency/Priority Rating Summary**. Duplicate the **Consistency/Priority Rating Summary** and distribute it to each individual in the cluster.

Step 2:
Within your cluster, determine how important each Ideal will be in the school's action planning.

a. Each team member receives a copy of his or her cluster's completed Consistency/Priority Rating Summary, showing the degree of program consistency with each Ideal.

b. Working independently, team members consider each Ideal, and decides the ***priority level*** he or she believes it should receive in the action planning.

Here, too, use a one to five rating scale:

5 = Highest priority for action

3 = Moderate priority for action

1 = Low priority for action

Each cluster member records the priority rating each Ideal merits and records it on a Consistency/Priority Rating Summary.

c. Submit the individual results to a subcommittee that tallies members' ratings and calculate the cluster group's *average priority rating* for each Ideal. (For convenience, round all averages to the nearest whole, rounding down at .5.)

d. Record the cluster's average priority rating in the priority column of an unused Criteria/Priority Rating Summary. In the next step, these results will be placed on the Decision Matrix (Worksheet 8.3).

Step 3:
Each cluster group graphs its findings on a Decision Matrix.

a. The Decision Matrix (Worksheet 8.2) maps the findings into an easily interpreted summary of the assessment process. ***Each cluster group completes a Decision Matrix.*** Together the three cluster groups' graphs will be used in the next step as the basis of action planning.

b. On the Decision Matrix, the horizontal axis represents the degree of consistency of the school's mathematics program with each Ideal. It goes from a LOW consistency of one (l) to a HIGH consistency of five (5).

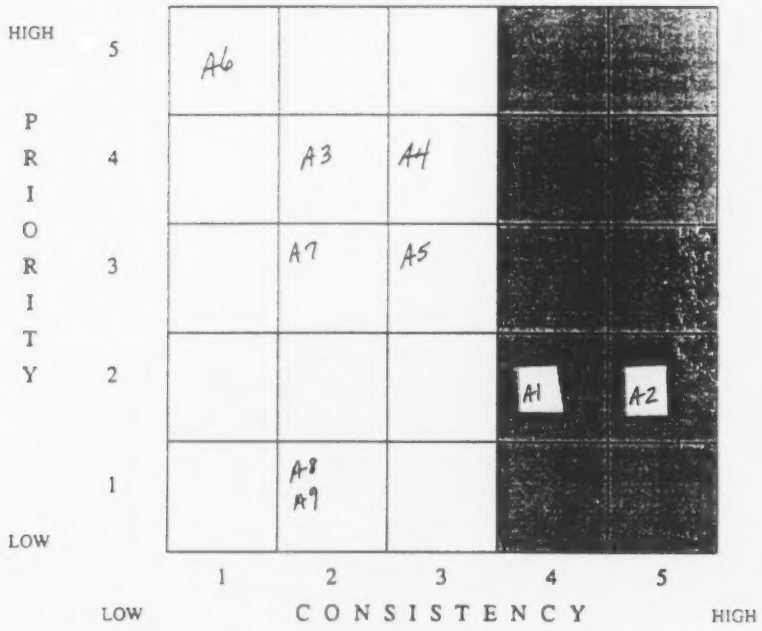
   The vertical axis represents the level of priority for action attributed to that Ideal. It runs from a LOW priority for action of one (1) to a HIGH priority for action of five (5).

c. Using the data from the clusters' Consistency/Priority Rating Summary, plot each Ideal (labelling it with its Criterion letter as well as Ideal number) in the appropriate segment on the graph, as shown in the example on the following page.

	Degree of Consistency	Level of Priority
A1.	4	2
A2.	5	2
A3.	2	4
A4.	3	4
A5.	3	3
A6.	1	5
A7.	2	3
A8.	2	1
A9.	2	1

TEMPLATE FOR WORKSHEET 8.2
MAP Decision Matrix

Cluster MATHEMATICS / TEACHERS



d. Once each Ideal is plotted on the Decision Matrix, the cluster has a graphic representation of its results and is ready for action planning with the other cluster group members. Interpret the Matrix as follows:

Program Strengths (right side) are the Ideals with which the school's mathematics program is most consistent.

Immediate Program Needs (upper left corner). The cluster's assessment data showed that the mathematics program was least consistent with these Ideals, and members agreed they should receive the highest priority for action planning.

Second Order Needs (the gray areas). The cluster's data indicated that these Ideals also received low consistency ratings and were deemed to be of low to moderate priority for action.

Step 4:
Teams use clusters' Decision Matrices (Worksheet 8.3) to determine Program Strengths and Immediate Program Needs.

a. Team co-leaders use the three clusters' Decision Matrices to determine Program Strengths (S), Immediate Program Needs (1), and Second Order Needs (2).

From each Decision Matrix, record the three cluster groups' evaluations of Ideals as follows:

Worksheet 8.3
Program Strengths/Needs Summary

Instructions: Indicate each cluster's determination in the appropriate column.
Program Strengths = S
Immediate Program Needs = 1
Second Order Needs = 2
If a cluster had no questions addressing this Ideal, indicate with a slash (/).
After discussion, record the group consensus in the "Decision" column.

A. CONTENT	MTI	IF	ASC	Decision
A1. The curriculum provides a problem-based learning context.	S	/	S	S
A2. Mathematics problems occur in varied formats and contexts.	S	/	2	S
A3. The curriculum content is balanced and comprehensive.	1	/	1	1
A4. The curriculum develops number and operation sense.	1	/	2	* 2
A5. The curriculum develops spatial and measurement sense.	2	/	S	* 2
A6. The curriculum includes probability and statistics.	1	/	2	* 1
A7. The curriculum introduces algebraic notions of variables, equations, and functions.	2	/	2	2
A8. The curriculum emphasizes understanding of concepts and procedures.	2	1	1	1
A9. The curriculum is research-based and responds to a changing society.	2	1	1	* 2

Note: Decisions about program strengths and needs depend finally upon team disussion They are not necessarily an average of cluster judgments Note * items.

At the completion of this step, the team can easily see the findings from the three clusters. The next step is to consolidate the information.

c. Leaders convene the assessment team to determine which Ideals warrant attention in the action plan. Team members review the cluster decisions recorded on the Program Strengths/Needs Summary (Worksheet 8.3).

The team then makes its final decisions for action planning. In the decision column, it records which Ideals are program strengths (S), immediate program needs (1), or second order needs (2).

After completing this step, re-examine the decision column within each Criterion and reconfirm the accuracy of the decisions. Make any final adjustments necessary, marking with an "S" all Ideals the team considers strengths and with "1" all Ideals the team considers immediate program needs.

Part II:
Mathematics Assessment team identifies the strengths of the program and priorities for action planning.

Remember: Team members, working now as a committee of the whole, will identify the strengths of the current mathematics program and priorities it selects for action, using the Program Strengths/Needs Summary (Worksheet 8.4).

Step 1.
Identifying program strengths across clusters

a. The assessment team -- working now as a committee of the whole -- examines the Program Strengths/Needs Summary (Worksheet 8.3).

b. Following discussion and debate, the group determines which Ideals nominated as strengths by clusters truly represent a strength for the school.

c. Within each Criterion, highlight the Ideals that are strengths and record them on Worksheet 8.4, Action Planning Guide - Part I.

Step 2.
Identifying priorities for action across clusters

a. Now re-examine the Ideals designated as immediate and second-order needs on Worksheet 8.4. Discuss the Ideals and the data that led to the cluster groups' decisions.

b. Agree upon which Ideals should be included as the team's top priorities for action. This decision can be made by a team vote, by the priorities designated on the chart, or by a consensus decision of the whole group.

Three considerations should influence decisions about priorities:

- Are the Ideals recommended for action selected from most of the nine Criteria?
- Is the number of Ideals selected for action small enough that the team can reasonably expect to implement its plan successfully in the next year or two?
- Are enough action priorities suggested for a meaningful improvement to emerge from this process?

c. Highlight up to three Ideals that the team decides to include in its action plan.

The team has now successfully identified both the strengths and priority needs of the school's mathematics program. A broad perspective and a wide range of opinions have been integrated into the team's thinking. Ideals within the MAP Criteria of Excellence describe the school's mathematics program strengths. Other Ideals, now written as action goals, are the basis of the school's action plan for achieving the future vision of its mathematics program.

Workshop 9 guides the team through the action planning process.

Worksheets for Analyzing Data Across Cluster Groups

(To accompany Workshop 8)

Use the worksheets on the following pages to complete this data analysis and to initiate action planning. Duplicate them as needed to complete the data analysis.

Worksheet 8.1	**Consistency/Priority Rating Summary**
Worksheet 8.2	**MAP Decision Matrix (2 copies)**
Worksheet 8.3	**Program Strengths/Needs Summary**
Worksheet 8.4	**Action Planning Guide: Part I** **Mathematics Program Strengths**

Worksheet 8.1
Consistency/Priority Rating Summary

Using the combined information from the assessment process, the team asssigns each Ideal a consistency rating of one to five, using the following scale:

5 = Completely consistent with the Ideal
3 = Moderately consistent with the Ideal
1 = Inconsistent with the Ideal

Using the following scale, determine the priority ratings for each Ideal on the basis of how important it is to the success of the school's mathematics program.

5 = Highest priority for action
3 = Moderate priority for action
1 = Low priority for action

A. CONTENT

Uses a problem-centered curriculum to develop students' conceptual understanding of mathematics, appreciation for its applications, and proficiency in computational skills.

CONSISTENCY	PRIORITY	
_____	_____	1. The curriculum provides a problem-based learning context.
_____	_____	2. Mathematics problems occur in varied formats and contexts.
_____	_____	3. The curriculum content is balanced and comprehensive.
_____	_____	4. The curriculum develops number and operation sense.
_____	_____	5. The curriculum develops spatial and measurement sense.
_____	_____	6. The curriculum includes probability and statistics.
_____	_____	7. The curriculum introduces algebraic notions of variables, equations, and functions.
_____	_____	8. The curriculum emphasizes understanding of concepts and procedures.
_____	_____	9. The curriculum is research-based and responds to a changing society.

B. INSTRUCTION

Engages students in a variety of learning experiences designed to promote mathematical exploration and reasoning.

CONSISTENCY	PRIORITY	
_____	_____	1. Students actively engage in mathematics.
_____	_____	2. Students discover meaning through manipulations with concrete materials.
_____	_____	3. Students learn individually and in groups.
_____	_____	4. Students construct meaning using a variety of resources and instructional materials.
_____	_____	5. Instruction makes appropriate and regular use of technology.
_____	_____	6. Instruction balances new learning, review, and homework.
_____	_____	7. Supplementary programs and enrichment activities extend mathematics instruction beyond the classroom.
_____	_____	8. Homework extends mathematics learning and applies new study skills.

C. THINKING PROCESSES

Develops students as problem solvers, critical thinkers, and effective communicators in mathematics.

CONSISTENCY	PRIORITY	
_____	_____	1. Thinking processes reflect multiple strategies for problem solving.
_____	_____	2. Teachers model problem solving.
_____	_____	3. Students pose problems and discover solutions.
_____	_____	4. The curriculum develops analytical reasoning abilities.
_____	_____	5. Students and teachers discuss mathematical ideas.
_____	_____	6. Students write and talk with one another about mathematics.
_____	_____	7. Teachers clarify underlying concepts and listen to students' ideas.

D. DEVELOPMENTAL DIVERSITY

Provides instruction and resources to meet young adolescents' diverse learning needs.

CONSISTENCY	PRIORITY	
_____	_____	1. Students have equal access to information, assistance, and classroom interaction.
_____	_____	2. Teachers use fair and flexible grouping practices.
_____	_____	3. Teachers accommodate special needs, abilities, and disabilities.
_____	_____	4. Teaching strategies motivate underachievers.
_____	_____	5. The classroom environment invites participation by all students.
_____	_____	6. Staff development and planning focus on young adolescents' needs.

E. ATTITUDES

Fosters positive attitudes about mathematics and encourages and recognizes students' accomplishments.

CONSISTENCY	PRIORITY	
_____	_____	1. Teachers believe all students are capable of mathematics achievement.
_____	_____	2. Students believe they can be successful in mathematics.
_____	_____	3. Students help develop high expectations and standards for themselves and others.
_____	_____	4. The school recognizes and rewards the mathematics achievements of all students.
_____	_____	5. Originality and accuracy in mathematics are both rewarded.
_____	_____	6. Students are free to make mistakes and are encouraged to take risks.
_____	_____	7. The school encourages families to expect and support mathematics achievement.
_____	_____	8. School support personnel (counseling staff, media specialists, etc.) assist in promoting the mathematics program.
_____	_____	9. The community values mathematics achievement.

F. RELEVANCE

Relates mathematical knowledge to students' interests, experiences, and future goals.

CONSISTENCY	PRIORITY	
_____	_____	1. Teachers relate mathematics to individual interests.
_____	_____	2. Imaginative uses of mathematics are stimulated.
_____	_____	3. Mathematics is applied to the arts and sciences.
_____	_____	4. The usefulness of mathematics is taught across subjects.
_____	_____	5. The program stresses the importance of mathematics in everyday life and in future career choices.

G. COLLEGIALITY

Inspires collegiality among faculty who work together to implement responsive programs for young adolescents.

CONSISTENCY	PRIORITY	
_____	_____	1. The mathematics program has strong leadership and an effective, caring staff.
_____	_____	2. The school and district support teachers' continuing mathematics education.
_____	_____	3. The mathematics department conducts regular program reviews and plans in-service activities.
_____	_____	4. Interdisciplinary collaboration promotes mathematics understanding.
_____	_____	5. Administrators encourage professional involvement.
_____	_____	6. Schedules enable collaborative planning.

H. COMMUNITY

Involves parents and the community in a collaborative effort to promote student competence in developing and using mathematical knowledge.

CONSISTENCY	PRIORITY	
_____	_____	1. Parents and community are involved in improving the mathematics program.
_____	_____	2. Parents are informed about the development and purposes of the mathematics program.
_____	_____	3. Parents are informed of specialized support and instructional assistance in mathematics.
_____	_____	4. Parents are informed of mathematics curriculum options and their consequences.
_____	_____	5. Parents and community participate in mathematics activities in and outside of school.

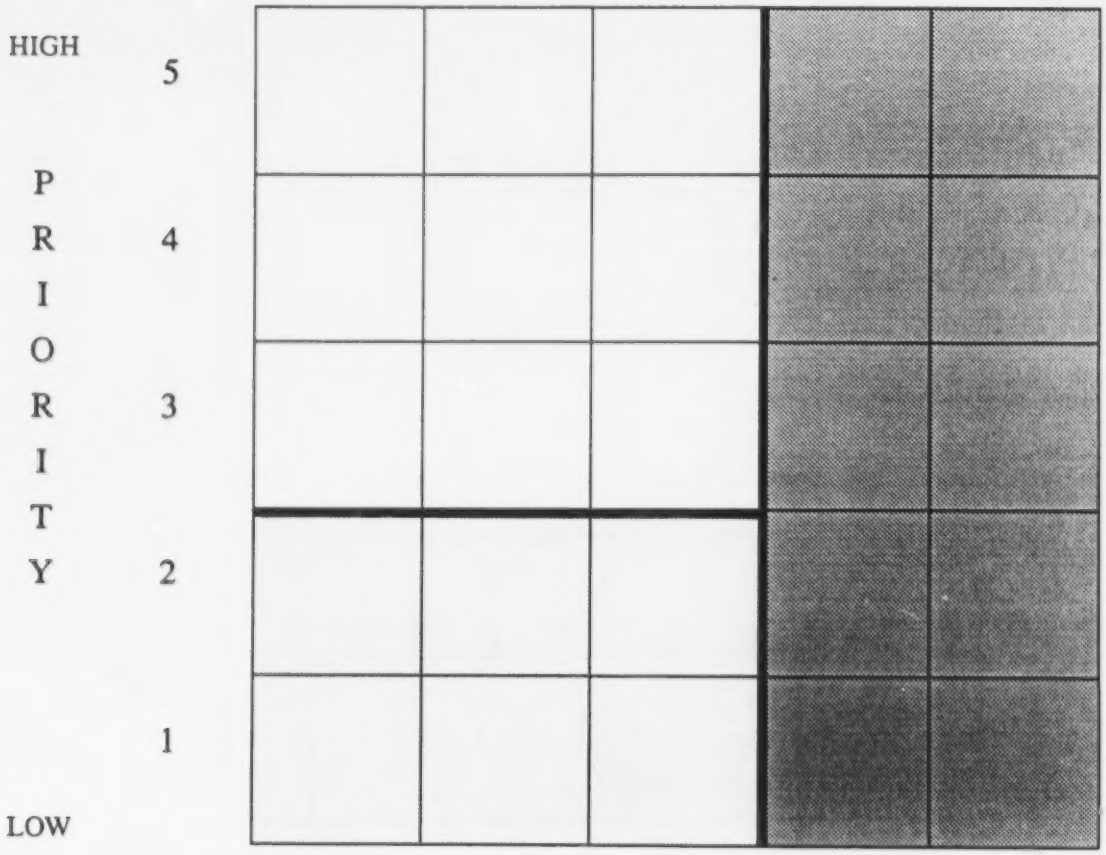
I. CONTINUING ASSESSMENT

Continually monitors student achievement, evaluates program effectiveness, and uses the results to determine the need for improvement.

CONSISTENCY	PRIORITY	
_____	_____	1. Individual student achievement is evaluated by multiple sources.
_____	_____	2. Students and parents receive constructive feedback.
_____	_____	3. Assessment sources address school, district, state and national goals.
_____	_____	4. Grading policies are clearly defined and administered consistently.
_____	_____	5. The mathematics program is evaluated through multiple sources.
_____	_____	6. Teachers in all subject areas participate in program planning and evaluation.
_____	_____	7. The mathematics program coordinates with the mathematics programs in feeder elementary and receiving high schools.
_____	_____	8. The mathematics Department monitors curriculum materials for bias.

Template for Worksheet 8.2
MAP Decision Matrix

Cluster _____



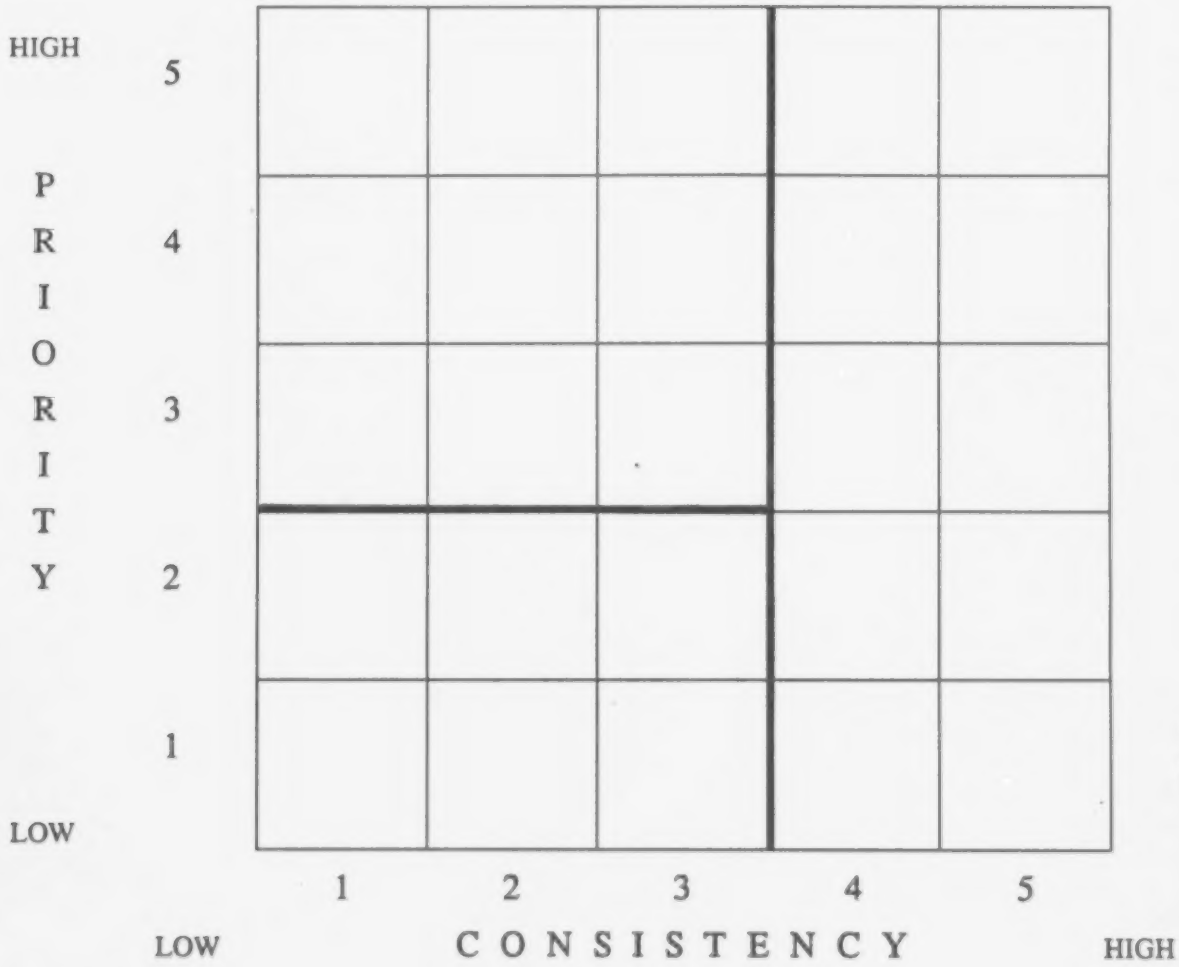
Program Strengths. These are the Ideals with which the school's mathematics program is most consistent.

Immediate Program Needs. This cluster's assessment data showed that the mathematics program was least consistent with these Ideals, and members agreed they should receive the highest priority for action planning.

Second Order Needs. The cluster's data indicated that these Ideals also received low consistency ratings and were deemed to be of low to moderate priority for action.

Worksheet 8.2
MAP Decision Matrix

Cluster _____



Program Strengths (right side). These are the Ideals with which the school's mathematics program is most consistent.

Immediate Program Needs (upper left). This cluster's assessment data showed that the mathematics program was least consistent with these Ideals, and members agreed they should receive the highest priority for action planning.

Second Order Needs (lower left). The cluster's data indicated that these Ideals also received low consistency ratings and were deemed to be of low to moderate priority for action.

Worksheet 8.3
Program Strengths/Needs Summary

Instructions: Indicate each cluster's determination in the appropriate column.
Program Strengths = S
Immediate Program Needs = 1
Second Order Needs = 2
If a cluster had no questions addressing this Ideal, indicate with a slash (/).
After discussion, record the group consensus in the "Decision" column.

A. CONTENT	MTI	IF	ASC	Decision
A1. The curriculum provides a problem-based learning context.				
A2. Mathematics problems occur in varied formats and contexts.				
A3. The curriculum content is balanced and comprehensive.				
A4. The curriculum develops number and operation sense.				
A5. The curriculum develops spatial and measurement sense.				
A6. The curriculum includes probability and statistics.				
A7. The curriculum introduces algebraic notions of variables, equations, and functions.				
A8. The curriculum emphasizes understanding of concepts and procedures.				
A9. The curriculum is research-based and responds to a changing society.				

B. INSTRUCTION	MTI	IF	ASC	Decision
B1. Students actively engage in mathematics.				
B2. Students discover meaning through manipulations with concrete materials.				
B3. Students learn individually and in groups.				
B4. Students construct meaning using a variety of resources and instructional materials.				
B5. Instruction makes appropriate and regular use of technology.				
B6. Instruction balances new learning, review, and homework.				
B7. Supplementary programs and enrichment activities extend mathematics instruction beyond the classroom.				
B8. Homework extends mathematics learning and applies new study skills.				

C. THINKING PROCESSES

		MTI	IF	ASC	Decision
C1.	Thinking processes reflect multiple strategies for problem solving.				
C2.	Teachers model problem solving.				
C3.	Students pose problems and discover solutions.				
C4.	The curriculum develops analytical reasoning abilities.				
C5.	Students and teachers discuss mathematical ideas.				
C6.	Students write and talk with one another about mathematics.				
C7.	Teachers clarify underlying concepts and listen to students' ideas.				

D. DEVELOPMENTAL DIVERSITY

		MTI	IF	ASC	Decision
D1.	Students have equal access to information, assistance, and classroom interaction.				
D2.	Teachers use fair and flexible grouping practices.				
D3.	Teachers accommodate special needs, abilities, and disabilities.				
D4.	Teaching strategies motivate underachievers.				
D5.	The classroom environment invites participation by all students.				
D6.	Staff development and planning focus on young adolescents' needs.				

E. ATTITUDES

		MTI	IF	ASC	Decision
E1.	Teachers believe all students are capable of mathematics achievement.				
E2.	Students believe they can be successful in mathematics.				
E3.	Students help develop high expectations and standards for themselves and others.				
E4.	The school recognizes and rewards the mathematics achievements of all students.				
E5.	Originality and accuracy in mathematics are both rewarded.				
E6.	Students are free to make mistakes and are encouraged to take risks.				
E7.	The school encourages families to expect and support mathematics achievement.				
E8.	School support personnel (counseling staff, media specialists, etc.) assist in promoting the mathematics program.				
E9.	The community values mathematics achievement.				

F. RELEVANCE

		MTI	IF	ASC	Decision
F1.	Teachers relate mathematics to individual interests.				
F2.	Imaginative uses of mathematics are stimulated.				
F3.	Mathematics is applied to the arts and sciences.				
F4.	The usefulness of mathematics is taught across subjects.				
F5.	The program stresses the importance of mathematics in everyday life and in future career choices.				

G. COLLEGIALITY

		MTI	IF	ASC	Decision
G1.	The mathematics program has strong leadership and an effective, caring staff.				
G2.	The school and district support teachers' continuing mathematics education.				
G3.	The mathematics department conducts regular program reviews and plans in-service activities.				
G4.	Interdisciplinary collaboration promotes mathematics understanding.				
G5.	Administrators encourage professional involvement.				
G6.	Schedules enable collaborative planning.				

H. COMMUNITY

		MTI	IF	ASC	Decision
H1.	Parents and community are involved in improving the mathematics program.				
H2.	Parents are informed about the development and purposes of the mathematics program.				
H3.	Parents are informed of specialized support and instructional assistance in mathematics.				
H4.	Parents are informed of mathematics curriculum options and their consequences.				
H5.	Parents and community participate in mathematics activities in and outside of school.				

I. CONTINUING ASSESSMENT

		MTI	IF	ASC	Decision
I1.	Individual student achievement is evaluated by multiple sources.				
I2.	Students and parents receive constructive feedback.				
I3.	Assessment sources address school, district, state and national goals.				
I4.	Grading policies are clearly defined and administered consistently.				
I5.	The mathematics program is evaluated through multiple sources.				
I6.	Teachers in all subject areas participate in program planning and evaluation.				
I7.	The mathematics program coordinates with the mathematics programs in feeder elementary and receiving high schools.				
I8.	The mathematics Department monitors curriculum materials for bias.				

School _____

Report Date _____

Worksheet 8.4

Criteria:

ACTION PLANNING GUIDE: PART I

Mathematics Program

Strengths

Consistent Criteria and Ideals	Examples	Continuation Plan

MAP Staff Development Guidelines
c. CATALYST/NCSU, 1991.

Workshop Outline 9
Completing Action Plans

Purpose

To review cluster groups' recommendations and use them to determine an action plan for improving the school's mathematics program.

Objectives

1. List program strengths, examples, and plans for continuing strengths.
2. Restate priority Ideals as action planning goals.
3. Determine an action plan for schoolwide mathematics improvement.
4. Prepare a draft of a proposed action plan for faculty review and approval.
5. Finalize an agreed-upon action plan and initiate implementation.

Resources

1. **MAP User's Manual**, Section 4, *Generating and Reporting an Action Plan* and *Implementing a Mathematics Improvement Plan.*
2. Sample action plans from Appendix 4 of this volume.
3. From Workshop 8, Cluster group data summaries, Consistency/Priority Rating Summaries, and Decision Matrices.
4. From Workshop 8, the team's complete Program Strengths/Needs Summary and the partially complete Action Planning Guide, Part I: Mathematic Program Strengths.
5. Handouts and transparencies listed on the next page.

Handouts

9.1 Action Planning Guide: Determining Priorities for Action

9.2 Implementing Changes

Action Planning Guide: Determining Priorities for Action

This section outlines procedures for action planning. The process is divided into three phases.

- Complete a list of mathematics program strengths
- Record agreed upon goals for action planning
- Write an action plan for mathematics program improvement

Two worksheets (**Action Planning Guide I,** Worksheet 8.4 from the previous workshop, and **Action Planning Guide II**, Worksheet 9.1 from this workshop) are available to guide action planning.

Begin the planning by referring to the completed documents from Workshop 8, **Program Strengths/Needs Summary** (Worksheet 8.3) and the **Action Planning Guide - Part I** (Worksheet 8.4).

Determine a schedule of planning meetings with small study groups and/or sessions with the whole team to complete action planning. Often, the initial brainstorming of action strategies for improvement and planning are most efficiently accomplished by small groups charged with proposing changes to the larger team.

Complete Action Planning Guide - Part I
Mathematics Program Strengths

Program strengths were recorded on Worksheet 8.4 in the previous series of assessment meetings. Now, the team should list one or two examples of the program's strengths next to each Ideal, and briefly explain how strengths will be sustained. This is a useful way to remind colleagues and the community about school's current achievements.

Determine Goals for Action Planning

The Ideals that were highlighted on the **Program Strenths/Needs Summary** (Worksheet 8.3 from Step 2 of Workshop 8) comprise the goals of the team's action plan.

Make multiple copies of the Action Planning Guide: Part II - Priorities for Action (Handout 9.1 on the next page) to record goals for each criteria. ***Rewrite each ideal as a goal statement***, following the procedure in the following example.

> ***Example***: Assume Ideal A-3--"The curriculum is balanced and comprehensive"--had a consistency rating of 2 and a priority rating of 5, and the team agrees it will be listed as a goal for action planning.
>
> Look back at the questions that were asked about that Ideal and clarify the ways that the program was inconsistent with the Ideal.
>
> Using the team's ideas, along with the questions in the assessment instruments as guides, revise the Ideal as a goal statement, e.g. "The mathematics department will write new instructions on teaching concept development, problem solving, and mathematical applications for its sixth through eighth grade curriculum guide."

Proceed through all the Ideals from the **Program Strengths/Needs Summary**, rewriting and recording those highlighted for action. It is a good idea to cluster Ideals by Criteria.

Once the goals are written and recorded on Worksheet 9.1, the team is ready to design its plan of action.

School _____

Report Date _____

Worksheet 9.1

Criteria:

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line

Resources and Assistance Needed

MAP Staff Development Guidelines
c. CATALYST/NCSU, 1991.

Complete Action Planning Guide:
Part II
Priorities for Action

The following steps structure the action planning, using the **Action Planning Guide: Part II - Priorities for Action.** Also, this section concludes with tips for accomplishing the major action planning activities. Turn to them, as needed, to keep the team's thinking focused and action-oriented.

1. Agree upon the goals for action within each Criterion. Using one action planning page for each Criterion, list the goals in Column 1. For each goal, record in Column 2 the Ideal's priority rating. Use as many pages as necessary to list all of the team's priority goals. Remember, the most workable goal statements are:

   - Clearly stated
   - Simple and direct
   - Achieved with reasonable support
   - Agreed upon by team members
   - Specified in priority order

2. Brainstorm possible action strategies for each goal. Adhere to the following "Rules of thumb" for brainstorming to generate a wide variety of possible action alternatives.

   - Encourage each person to suggest every idea that comes to mind.
   - Record each idea as it is stated (no editing!).
   - Move rapidly -- details are not necessary.
   - Build on one anothers' ideas.
   - Set a time limit (5 - 10 minutes)
   - Generate as many ideas as possible during the brainstorm period.

   Remember to accept all ideas generated during the brainstorming process; do not discuss, critique, or reject any until brainstorming has concluded.

3. Agree upon what actions must be taken to meet each goal, and describe the plans briefly in Column 3. To reach a consensus, follow these suggestions:

   - One person summarizes the issues discussed.
   - Ask individuals to clarify or explain their positions.
   - Discuss alternative points of view--emphasizing pros and cons.
   - Revise ideas and include suggested modifications that group members agree upon.
   - Rewrite a comprehensive statement that represents the consensus.

4. Identify the individual(s) responsible for carrying out actions. Record their names in Column 4. As often as possible, designate two- to three-person teams to carry actions forward.

5. Specify the time lines and the dates by which actions will be taken. Record the approximate completion dates in Column 5.

6. List any special resources, additional assistance, or support the team will need to meet the goals for action. For each goal, record this information on the appropriate page of the Action Planning Guide. Consider the following, as you determine what resources will be needed:

   - What kinds of resources will help implement our team's goals, e.g. human resources, staff development, new materials, consultant support?
   - What are possible sources for obtaining the resources needed?
   - Is additional funding required? If so, where might it come from?
   - Which colleagues have expertise they could share without cost?
   - Are there people in the school, the central office, or in the community who can provide the resources to assist without cost?

7. Double-check that the plan of action includes the following elements?

   - Clear, specific goal statements, with priority commitments that can reasonably be achieved within the next year or two.
   - Practical suggestions that will help accomplish each goal?
   - Individuals designated to take the lead in meeting goals.
   - Realistic time lines and dates for completion.
   - The resources and assistance the mathematics department will need to implement the goals.

Action planning should be an open-ended process, one based on a broad discussion of options. Be creative and original, but seek ideas that are practical and have good likelihood for success. Look back at the questions in the assessment instruments for suggested innovative practices. Whenever possible, seek out old as well as new ideas that are practical and clearly effective. Include ideas that may have previously met with resistance, but might work now; also propose important new ideas that may requiring special funding.

This is a time for new visions and for planning changes. An action plan that represents a blend of the practical and ideal is one that will most likely move the school forward and engage the broadest support from colleagues, students, and parents. Completely explore ways to meet the action goals without additional resources. With encouragement, team members will find many no-cost and simple adjustments that will bring their current practices into alignment with the Criteria for Excellence.

Action items should incorporate plans teachers can implement in their own classes and with other team members. Many schools have resources that one or two teachers use often, but others do not know are available. Provide time to share these resources by

team teaching or by exchanging ideas in designated after-school staff development meetings. After exhausting no-cost items, include innovations that require additional resources or cooperation and support from administrators. Funds are increasingly available from the government, business partners, and the local school district for special mathematics programs. On the basis of carefully laid plans, schools should not hesitate to ask to use them.

As your team conducts its planning, consider these important issues:

> What instructional and organizational changes will bring our school's mathematics program into alignment with the MAP Criteria and Ideals?
>
> To accomplish our proposed changes, what specific aspects of the current program do we want to recommend restructuring or revising?
>
> What alternatives presented themselves during data gathering that are new ways to tackle old problems?
>
> Have we involved everyone on our team in the action planning, giving each individual a significant leadership role in the implementation?

Planning will proceed differently in each school. It will be affected by some of these potential obstacles.

- The amount of time team members have to meet and reach agreement about plans.
- The degree of similarity or difference among teachers' current practices.
- Teachers' familiarity with the developments in mathematics education and the concepts described in the Criteria for Excellence and in the NCTM *Standards*.
- Team members' prior experiences as planners and initiators.
- Availability of resources and support for making program changes from colleagues and parents within the school, and from consultants, administrators, or central office personnel.

Above all, be positive and constructive. Try to accomplish as much as possible, but do not be unduly critical if every goal is not articulated or agreed upon.

A practical, well-written plan takes time to think through and design. It requires collaboration and much candid discussion among colleagues. Most important, the team should be pragmatic, but it should strive to design a plan that stretches the school community to some extent.

Plans for altering programs should come out of brainstorming sessions and discussions that seek a "sense of the group" about reasonable actions to be taken by individuals and the staff as a whole. Avoid settling disputes through a majority rule. Instead, try to make action planning a means of reaching mutually agreed upon points of view that everyone can accept. Where there is strong disagreement, it may be useful to table issues temporarily rather than to try to force artificial consensus.

Appendices

Appendix 1
Conducting MAP Workshops: Suggestions for Team Leaders

Overview

The most successful staff development programs are those for which leaders are well prepared and confident about the material they present. To strengthen your leadership in both these respects, it can be valuable to conduct workshops collaboratively. Working with knowledgeable colleagues allows you to support one another. Sharing the responsibility for serving as "experts" can reduce stress and make the experience more enjoyable.

As teachers, you are experienced leaders of groups of students, and you can readily apply your skills to work with colleagues and other adult groups. The information presented below reviews successful techniques that experienced leaders of adult groups have learned. These suggestions can be especially helpful if you have led a staff development program.

Planning and Logistical Considerations

The Mathematics Assessment Process will be implemented most smoothly if, before beginning the assessment, team leaders plan a series of team workshops. The purpose of the workshops is to explain the overall purpose of MAP to colleagues schoolwide and to describe in detail the processes and the procedures the team will use as they conduct MAP. Schools will vary in the approaches they take to building their teams into cohesive working groups. This section, offering basic reminders and considerations for conducting staff development programs, provides a framework for planning effective workshops.

The plan for conducting workshop sessions will depend upon the scheduling flexibility in your school. Ultimately, the principal, the team, and the staff will make this determination. In some cases, it will be most practical to obtain substitute assistance and release time for a series of short sessions or half days; several all-day sessions will work best in other places. Another approach is to provide team members with stipends and to conduct the workshops after school or on weekends. However you structure the sessions, provide enough time and work in a location that is enables intensive, uninterrupted work.

The workshop guidelines in this notebook are developed for the six- to eight-person assessment teams that will lead MAP. However, the workshops or portions of them can be adapted easily for presentations to other groups, including the entire school faculty, parent and/or community groups, and study groups. Taken together, the workshop outlines and the accompanying suggestions for workshop leaders provide team leaders with a wide range of resources for leading their school's mathematics improvement effort.

At the conclusion of this appendix, several transparencies summarize the characteristics of well-functioning teams. Consult them as you read and prepare for your meetings. In addition, Appendix 2, **Organizing MAP Workshops: Logistical Considerations**, guides you step-by-step through the planning details involved with coordinating MAP workshops.

Who's In Charge Here?

We urge team co-leaders to use fully the resources and strengths of the many colleagues who have committed themselves to school mathematics improvement. Remember, MAP workshops--and the total assessment effort--are the **joint responsibility** of team co-leaders, the central office staff facilitator, and the principal. **Team leaders are the responsible coordinators of the process; the central office staff facilitator and principal, along with other team members, are resources for implementation.** Turn to them for assistance as you plan and lead the workshops and throughout the assessment itself.

Public Relations and Publicity

In this information age, public relations has become an increasingly important component of all projects, particularly those that take place in schools. Parents and community members want and need to know about efforts on behalf of students; as educators, we want them to be aware so we can turn to them for assistance and support. Thus, a school that is going to the lengths of examining its mathematics program so thoroughly and planning its future so comprehensively should take care to inform the public about its good and important work.

Often school districts have offices of information or public relations to assist schools with public relations. Early in the assessment planning, team leaders and principals should notify the district's information office about their commitment to MAP, and develop with the information office a strategy for information dissemination. This can be formal or informal, extensive or limited, but it should not be neglected.

Be as extravagant or as conservative as you decide is appropriate in developing and distributing materials about your school's plan to conduct the Mathematics Assessment Process for the Middle Grades. **The User's Manual** contains materials that can be modified easily by editors, journalists, or even students to describe your school's plans and activities.

Anything you disseminate -- be it simple or grand -- should be attractive, articulate, and clearly written. Grammar and spelling should be impeccable. Determine who in your community you think should know about your work and design special information for them. Announcements can be mailed, hand-delivered, or distributed by students. Local newspapers can be contacted and, possibly, a story about your school's efforts will be written.

The important point is that you are involved in a significant effort on behalf of your community's students. Share your plans and your investment widely. Since you have something to be proud of, let it shine!

Adults as Learners

Adults can be just as challenging and exciting to work with as young people. Adult learners are independent and experienced; they expect time to be used respectfully, and they can be vocal (and even uncooperative!) if expectations are not met. Since adult learners are problem-centered and task-oriented, one key to effective planning is using techniques and workshop materials that are aimed specifically at meeting participants' practical needs. As often as possible, engage your group in **doing** activities, and minimize telling them about what to do.

You will find greatest success as both team leaders and workshop leaders if you quickly establish an open environment for learning and working. Your workshop agenda should be well organized and explicitly responsive to colleagues. This may mean adjusting and modifying the structure of the pre-set workshops and guidelines as you go along.

Researchers have found four elements that characterize the best educational experiences for adult learners. Effective learning for adults is:

- **Self-directed** (each participant is actively involved in the learning process);
- **Experience-based** (learning activities are planned around the participants' experiences and interests);
- **Problem-centered** (learning centers on learners' real questions, needs, and problems, not only on "covering" the planned material); and
- **Immediately applied** (activities can be put into action immediately and are cognizant of the practical limits of the lives of teachers).

Leading Adults

As you begin each session or meeting, provide clear information about its purpose and specific objectives. Carefully explain the activities the group will undertake, linking them with the session or project objectives. An
agenda that states in simple language the overall workshop goals and, where necessary, the objectives of each activity, will give participants greater understanding of and interest in the tasks they are about to undertake.

Remember to demonstrate respect and caring for your colleague-participants--a respect that shows genuine concern for them as individuals and a commitment to help them with the work ahead. Although not all participants will receive the information you offer with equal interest or understanding, they will notice your attentiveness and be responsive to your courtesy and consideration.

The Leader's Varied Roles

As a group leader, there are several rules of thumb to follow in your approach to individuals

and to your MAP team. While these are also sound principles to use young people, they are particularly critical to success when working with adults.

- Reserve your personal judgments and perspectives until you have heard from others.
- Respect people's feelings and points of view and avoid passing judgment; convey your expectations that others will do the same.
- Be positive and encourage alternative perspectives.
- Be aware of and candid about your personal assumptions and biases.
- Do not try to be an authority on subjects you don't know thoroughly; rather, be willing to learn along with your group.
- Be frank about your personal style of group leadership (i.e. "This is how I do things; each of you will surely have a different approach").
- Be willing to adjust your approach or to defer to another's lead when appropriate.

Part of your role is to help participants find their place in the group. Members of your team will respond differently as they struggle to understand MAP, to comprehend their cluster's responsibility in the assessment process, and to determine their own role in the team structure. MAP calls upon teachers to undertake many new responsibilities and to do so with a minimum of preparation. Often they will be working in a vague and unpredictable context (i.e. when conducting interviews). This is especially unnerving for teachers who are accustomed to being well prepared and precise about their work. Members' needs for specific assistance and extra guidance will differ and may be unpredictable. Leaders will have to be alert, analytical, resourceful, and, most of all, **flexible**.

Remember that some people are naturally more comfortable in groups, making them open and talkative, while others are quieter and more restrained. A leader's respect, tact, and confidence can reduce potential tension.

When you are conducting meetings or workshop sessions, be alert to whether participants are yawning, fidgeting, engaging in private conversations, or questioning the validity of the content or process you are discussing. If any of these behaviors occur, there is most likely an unresolved problem to address. When problems arise, dealing openly with the issues of concern will help you avoid bigger problems later on. Among the techniques you might consider are:

- Sharing your observation of what is happening in the group, being candid about what concerns you about the reactions you are noticing;
- Asking individuals or, if necessary, the entire group, how the meeting agenda or program plans can be adjusted to better respond to their needs; and
- Meeting separately (at a coffee break or in a later private meeting) with discontented participants to respond personally to their concerns.

We are all most comfortable when we know what is expected of us and when we are confident that we will receive support to meet those expectations. Thus, be alert to individuals' uncertainties about their roles and responsibilities. Be especially attentive to colleagues who speak very little or not at all, for they may be confused, unengaged, or losing interest.

When possible, try to bring the quieter members into the discussion, but avoid making them self-conscious. While acknowledging the ideas of the most loquacious individuals, make an

effort to enable everyone in the group to participate however he or she is most comfortable.

Finally, try to adhere to the agenda and to your original plans, and keep the exchange of ideas on topic. It may be necessary to cut short remarks that threaten to sidetrack the group. Be certain to be tactful. In such cases, you can ask a person to hold onto the issue to pursue it in greater depth later. You may also need to restructure the agenda or plan an additional session or sub-committee meeting. Seek the group's assistance, asking for suggestions about addressing unresolved questions and exploring various viewpoints, while maintaining the schedule. The group can be most helpful in sharing the responsibility of keeping the discussion focused and on track.

Group Discussion: Vital to Staff Development Success

Since members of your group come to you with a wealth of individual experiences of their own, it is especially fruitful to include as much time as is possible for discussion of their experiences, perspectives, and interpretations of presented material. Leading a discussion can be more challenging than it might seem, however.

Certain kinds of questions are most likely to encourage purposeful discussion:

- Questions starting with "how" and "why" encourage participants to be analytical. They enable colleagues to apply what they know and to discover what they still need to find out.

- Questions that spark controversy and respectfully bring disagreements to the surface can broaden people's minds.

- Open-ended questions, such as those that begin with "In what way..." or "For what reasons..." are likely to elicit multiple responses. They foster attitudes that recognize the complexity of most significant issues.

Asking "one-right-answer" questions is *not* conducive to an atmosphere of learning. Participants are each experts in their own contexts and their expertise should be solicited, fully understood, and incorporated into the group's thinking.

Understanding Groups and How They Work

Knowledge about how and why people and groups act as they do enables you to direct learning more successfully.

Most group behavior is influenced by two basic factors: (1) participants' interest in learning the material that is presented by the leader; and (2) participants' personal commitment to the group structure and overall process.

Commitment to learning the content involved with conducting MAP will depend, in part, on team members' acceptance of the MAP concept and of their team leaders. Team members will be most cooperative and active when they understand the rationale for MAP, see their place in the process, acknowledge the value of the process to their school, and recognize their co-leaders' know-how and leadership.

This acceptance will evolve as team members become involved with the MAP materials and process, and from the trust that develops between team leaders and group members. Once trust is established, participants will continue to analyze the situation and, at each stage, they will tacitly decide whether to extend their commitment to the process. To encourage colleagues' trust and continuing involvement, there are several things you should consider.

- Be thoroughly prepared to explain the work you are asking the team to take on and plan carefully how you will present the MAP concepts and planning process.
- Be frank about what you do and do not know.
- Make sure the logistics run smoothly and be candid and apologetic about snafu that occur.
- Clarify participant expectations at the very beginning of each workshop session or MAP activity.
- Compare the your expectations at each phase with the group's established objectives.
- Review and highlight what will and will not be covered in workshops, and what will be expected from team members' in each phase of MAP.
- Summarize often what has been accomplished, routinely expressing in various ways your appreciation for people's participation.
- At the conclusion of each workshop or at any major phase in the process, discuss what occurred, how the process met with the group's expectations, and plan how any unmet expectations can be handled.
- Go slowly; do not try to do everything at once.

The second dynamic that shapes group behavior is the need of each person to locate him or herself within the structure of the group. This typically occurs throughout training and program implementation. At each phase in the process, team members will continue to seek ways to:

- Fit into and contribute to the group;
- Establish themselves as important members of the group;
- Guard their personal vulnerabilities; and
- Have their ideas and efforts recognized.

Together, the MAP co-leaders and facilitators should routinely examine their team members' levels of involvement and plan various strategies to sustain their commitment and interest. Good approaches to team building include encouraging people to work in successful dyads or triads; periodically recognizing achievements to the larger group, regularly saying "Thanks, we appreciate you" in small and large ways; and, when the process becomes wearing, suggesting ways to share responsibilities or to lift other burdens. Some teams have specifically defined a role for a "hospitality committee" whose job it is to be attentive to people's personal needs and to assist where they see they are needed.

Transparencies A1.1, A1.2, and A1.3 summarize a number of helpful reminders about the conditions that encourage effective teamwork and group planning.

Throughout the staff development workshops and the MAP implementation, team co-leaders, facilitators, and principals should remain alert to colleagues' developing understanding of their roles and to their continuing commitment to the process. When people waver about making commitments, or if they are unevenly fulfilling their responsibilities, they may not see or understand clearly their roles or responsibilities. Sensitivity, coupled with collaboration and full support of MAP team members, are critical elements of a successful team effort.

References: Suggstions for Team Leaders

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Functions of Change-Facilitating Teams

1. Obtain clearly stated support from the principal and central office facilitator, especially in these areas:
   - Sanctioning the planning and change process
   - Establishing MAP as a priority
   - Providing resources as needed
   - Endorsing the team members' activities and work throughout the year-long process
2. Pitch in to help one another
3. Agree on goals, objectives and plans; clarify team members' roles, responsibilities, and procedures
4. Plan continuously and openly
5. Keep in mind the overall goal of MAP is *mathematics improvement* for *all* students
6. Emphasize and support team collegiality
7. Learn from one another
8. Use team members' many interests and talents

Adapted from Hord, S. M., Rutherford, W.L., Huling-Austin, L., and Hall, G. (1987). **Taking Charge of Change.** Washington, D.C.: Association for Supervision and Curriculum Development.

What MAP Teams Can Do to Support School Planning

Develop supportive organizational arrangements

- Share the leadership
- Work in pairs or dyads
- Determine procedures for troubleshooting and assisting
- Establish clear guidelines and time lines

Provide sufficient training and coaching throughout

Offer regular consultation and reinforcement to team members

Monitor the process and lend a hand to colleagues as needed

Establish good team communications

- Among individuals
- Within clusters
- Across clusters

Establish good external communications with:

- Colleagues throughout the school
- School site and central office administrators
- Community groups and parents

Keep stakeholders and supporters informed

Alternative Team Member Roles

Every successful team makes use of the natural talents and personal styles of each of its members. Here are some typical strengths individuals usually have to offer their teams. As your group begins to work together, ask each member to determine which one or two of these roles is most characteristic of him or her. Capitalize on members' intuitive capacity to get the job done by calling upon them to serve in these roles on the MAP team.

Idea Champions

Members who are articulate advocates for improvement and change serve as the team's interpreters and promoters. While recognizing the costs and dilemmas involved with innovations, these individuals believe in and work towards achieving the potential promise of the group and the organization. Their excitement can be contagious. *Idea Champions* take responsibility for involving and mobilizing support for the overall improvement effort.

Context Analyzers

Every team works within practical contexts, i.e. within the limits of organizational priorities and policies, opportunities and constraints. These individuals are sensitive to the pragmatics of the existing context and help the team work their way around and through potential obstacles. Examples of context barriers that can be sensitively worked through by good *Context Analyzers* are:

- Faculty morale, life circumstances, community relations
- District priorities, other innovations, budget, and staffing changes
- Political events and pressures, e.g. school board elections, union contracts and actions, and legislation or community actions

Coordinators and Communicators

These people intuitively take responsibility for coordinating among potentially conflicting agendas and people involved in the change process, e.g. the many program implementation activities; numerous ongoing school improvement innovations; the objections of the "old" guard and the hopes of the "new" guard; and building-level and the district priorities.

Coordination involves ensuring that there are clear communications among all team members and other school and district personnel. At another level, it means cooperation, sharing of resources, and collaborating to solve common problems. *Coordinators and Communicators* intuitively and skillfully anticipate and resolve conflicts, and they communicate smoothly among many people to help ensure a team's success.

Support Providers

Teams need nurturing, and *Support Providers* offer help with many kinds of implementation challenges, including logistical assistance (providing materials, equipment, scheduling, procedures, room arrangements); psychological support (encouragement, affirmation, acceptance of frustrations and uncertainties); content or substantive help (developing and using new methods and skills); and following-up and applying ideas and concepts in practice.

Implementation Monitors

Implementation Monitors skillfully attend to the practical side of the challenges of program implementation and follow through. They are the team members, leaders, and administrators who informally or formally take responsibility for getting the job done. Their attentiveness to time lines and to implementation details ensures that each phase of the project occurs on schedule.

Adapted from Eiseman, J.W., Fleming, D.S., and Hergert, L.F. (1988). "Role of Teams" -- Handout, Activity 2, in The Role of Teams in Implementing School Improvement Plans. Andover, MA: The Regional Laboratory for Educational Improvement of the Northeast and Islands.

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Appendix 2
Implementing MAP Workshops: Logistical Considerations

Deciding to Conduct Workshops

1. **Review - *Making Logistical Decisions: Questions to Consider* (from Appendix 1 in the MAP User's Manual)**

   Begin your planning by reviewing the questions in Appendix 1. Team leaders may develop a draft timeline for the team to review and consider once its meetings begin.

2. **Determine which workshops you will conduct and set workshop dates**

   List the specific workshop components you will use in your school and design a time line for conducting the entire workshop series. Review these plans with the principal and with other key workshop leaders. Obtain their approval and final agreement to assist as needed.

Intermediate Planning

1. **Confirm workshop dates and procedures**

   Double check the workshop dates against the school calendar and with all team participants to ensure that everyone will be able to attend all meetings. Be sure to clarify the schedule for the parent(s) or business partner(s) on your team. It is especially important that they be included throughout the process.

   Select the site(s) or room(s) for the workshops.

   Clear plans with the principal and the central office facilitator to assure there are no major school or district conflicts for either personnel or meeting room(s).

   In many schools it is a good idea to receive **advance, written approval** for the dates, room arrangements, and names of individuals who will be involved in major meetings. Needs for substitutes and verification of stipends may also require early written confirmation.

2. **Assign responsibilities**

   Summarize the major tasks and activities that must be completed for each workshop, specifying who will be responsible for leading and co-leading specific segments.

Distribute among team leaders and members the responsibility for making various logistical arrangements such as those for stipends or substitutes, rooms and refreshments, scheduling observations and interviews, preparation and distribution of materials, and sending reminder notices, thank-you letters, or articles for newsletters (if appropriate).

3. **Preliminary agenda**

Prepare a long-range agenda and disseminate it to participants as early as possible. At least several days prior to each workshop session, distribute a final agenda along with a reminder of the workshop day, location, and meeting time.

4. **Define leadership roles**

Clarify roles and responsibilities for each co-leader and/or facilitator so the workshop is a truly collaborative effort.

Week of the Workshop

1. **Finalize agenda and plans**

Prepare final workshop schedules, agendas, and evaluation forms (if necessary).

Confirm that the designated room will be available as planned.

Arrange for substitutes or stipends (if necessary).

Remind colleagues who are assisting with the workshop of their designated responsibilities and roles.

2. **Prepare materials**

Plan and prepare materials.

Arrange to have on hand all necessary audiovisual equipment and obtain any additional resource materials. Produce and/or duplicate readings, handouts, and transparencies that will be needed during the workshop.

Several days before the scheduled meeting, distribute the final agenda and any information requiring advance reading.

Put meeting reminder notices in colleagues' mailboxes the day before. Remind the principal and the central office contact person of meeting dates and of the agenda. (While principals and central office personnel should be welcomed to drop in, their presence is *not* mandatory.)

3. **Set up the workshop room**

Collect all necessary supplies and have them ready in the meeting room prior to the workshop's scheduled convening time. Check audiovisual equipment to assure it is in good working order.

4. **Refreshments**

Arrange for refreshments. It is helpful to have refreshments that are healthful, including some that have little or no sugar or caffeine. Staff development experts have become increasingly aware of the beneficial effects of eating healthfully at meetings and planning sessions, especially those that take place at the end of long work days.

5. **Conduct the workshop(s)**

Conduct the workshop(s) according to plans, having participants complete feedback forms at the conclusion of each session.

After the Workshop

1. **Clean up**

Clean up the workshop area and return equipment and materials.

2. **Review the workshop evaluation feedback**

Summarize feedback from participant evaluations. With co-leader, debrief the workshop session, and plan changes for the next session, or for later follow-up meetings.

3. **Plan next workshop or follow-up**

Formally or informally notify the principal about how each workshop went, sharing concerns or questions about the roles of the various individuals in the process or about the process itself. Plan any adjustments you may need to make.

Repeat this cycle of preparatory and implementation activities for each workshop you conduct.

Evaluation

It is extremely important for leaders to obtain regular feedback on the effectiveness of workshop sessions so the staff development process responds to participants' interest and needs. Below is a sample workshop evaluation form to be used as is or modified.

Workshop Feedback Form

Implementing MAP: [*Place title of workshop here.*]

Leaders: _____ Date: _____

Workshop purpose: [*List overall purpose of the workshop here.*]

1. In general, did we adequately cover the information you needed to understand this component of MAP?

Poor	So So	Excellent
1	3	5

2. Was the information relevant for your role on the Team?

Off the Mark	Somewhat	On Target
1	3	5

3. How could we have made the workshop more useful to you?

4. Overall, how would you rate this workshop?

Poor	So-so	Excellent
1	3	5

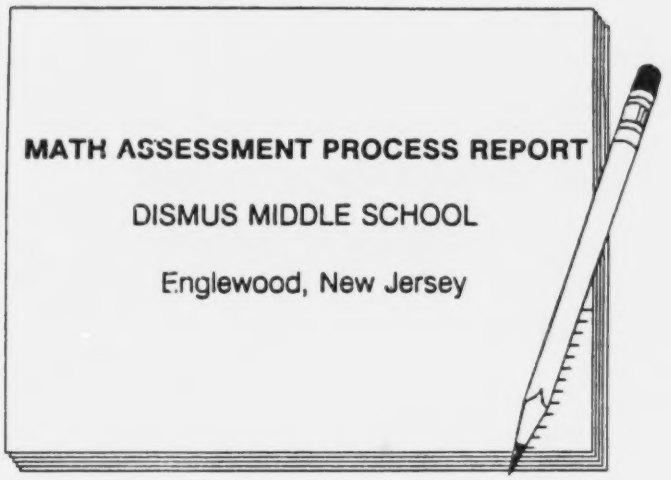
5. On the back of this sheet, please indicate any issues or questions you would like us to address further, either in our next workshop or with team clusters or individuals.

Thanks for taking the time to provide us with feedback.
Feel free to use the back for additional comments.

Appendix 3
Examples of MAP Action Plans

Janice Dismus Middle School

C.W. Johnson Middle School



MATH ASSESSMENT PROCESS REPORT

DISMUS MIDDLE SCHOOL

Englewood, New Jersey

"**MAP**" Team Members: L. Bonney
E. Stephens
B. Devers
D. Huggett
Dr. Roberts

With the input from the 1990-1991 Dismus Middle School Staff
For implementation by the Englewood Board of Education

Submission Date: June 6, 1991

Contact Persons: D. Hines & T. Johnson
Dismus Middle School
Englewood, NJ 07631
(201) 833-6344

c. CATALYST/NCSU, 1991

THE "MAP" TEAM

The following is a list of the dedicated members of the "MAP" team. This project would not have been possible without their tireless efforts in behalf of the mathematics assessment project.

Dolores Hines - co-leader
Computer Science - Dismus Middle School

Thomas W. Johnson - co-leader
Language Arts - Dismus Middle School

Leo Bonney - team member
Mathematics - Dismus Middle School

Elease Stephens - team member
Language Arts - Dismus Middle School

Dr. Sylvia Roberts - community member
Administration/Supervision - City College of NY

Beverly Devers - parent member
AT&T - New Jersey

Donald Huggett - administrative liason
Vice Principal - Dismus Middle School

Sondra Akins - ex-officio member
Director of Math, Science & Technology - Englewood

Dr. Henry Pruitt - ex-officio member
Principal - Dismus Middle School

Dr. Ellen Pechman - co-project director
North Carolina State University

Dr. Sigrid Wagner - co-project director
University of Georgia

THE MISSION OF "MAP"

The Mathematics Assessment Project (MAP) is a needs assessment process which was conducted at the Middle School during the 1990-1991 school year.

The purpose of "MAP" was to obtain input from teachers, students, parents, administrators and community members relative to the status of the math program at Janis Dismus Middle School (JDMS).

The data collected was used to identify areas in need of improvement in the mathematics program at JDMS.

Finally, a list of recommendations was generated in order to bring about program improvement.

I. Problem Solving Approach To Instruction & Learning

The Middle Schoool's goals for problem solving in Mathematics stem from the following "MAP" Ideals based on the National Council of Teacher's of Mathematics (NCTM) standards:

"Curriculum develops analytical reasoning and problem solving abilities."
"Students help develop high expectations and standards for themselves and others."

The staff offers the following prioritized recommendations to help facilitate and improve our instruction of math:

A. Curriculum Strategies:

·Update the Math curriculum document with appropriate format which considers grade level outcomes, assessment, timelines

·Develop problem-based interdisciplinary instructional units of study.

·Enhance the curriculum to include algebraic concepts for all grades. Re-evaluate and strengnthen the 7th grade math program considering alternatives which will emphasize enrichment as well as integration of math topics.

·Select every potential 7th grade student for an Algebra/Enrichment course by multiple means of assessment.

·Continue to develop the Middle School's Criterion Reference Testing Project (Testbuilder) as a component for multiple assessments.

·Present and share the "MAP" plan of action with the Outcomes committee.

·Continue to evaluate the implemented recommendations of the "MAP" action plan.

B. Instructional Strategies in the Classroom:

·The basic elements of cooperative learning are positive interdependence, individual accountability, face-to-face interaction, cooperative skills, and group processing. Emphasize cooperative learning/problem solving in the classroom. This will allow students to make decisions and assume responsibility for their own learning, regarding their learning tasks, i.e. individual projects, task cards, etc.

·Employ multiple assessment techniques such as interview, surveys, portfolio, criterion reference testing in addition to teacher prepared tests.

NOTE: THE MAP PLAN INCLUDES NINE APPENDICES THAT SPELL OUT IMPLEMENTATION DETAILS. DUE TO SPACE LIMITATIONS, THE APPENDICES ARE NOT INCLUDED HERE.

THE VISION FOR PROGRAM IMPROVEMENT

We, the "MAP" team, have a vision that our students will become confident and competent problem solvers.

In order for this to occur, the math program must address the ever changing curricula needs by keeping abreast and utilizing technologies to assist with math instruction at the classroom level.

Teachers must set high standards as well as high expectations for all students.

This requires that teachers be knowledgable of content, instructional strategies and understanding of the needs of students with diverse learning styles.

Additionally, parents, community members and other stakeholders should join together to support successful math instruction.

Finally, lines of communication at all levels must remain open to the free discussion of the service delivery, program evaluation and equity in the classrooms.

The "MAP" team believes that if such a mathematically sound environment is provided for students along with appropriate teacher training, materials, funding and support - the Janis Dismus Middle School will be well on its way to a sound and viable mathematics program.

MATH ASSESSMENT PROCESS REPORT

The "MAP" action plan is a component of the district wide initiative for the improvement of all areas of instruction.

After a thorough evaluation of the Dismus Middle School's Math Program and an analysis of all the data, i.e. observations, surveys and interviews, the "MAP" team chose three areas of concern:

I. The Problem Solving Approach To Instruction
II. The Use of Technology
III. Collaboration/Communication

These three areas become the target of the improvement plan presented in this document.

The "MAP" improvement plan will need to be monitored for several years and coordinated with district-wide efforts to improve mathematics. A monitor, is strongly recommended at the Dismus Middle School to facilitate the decisions regarding Math/Technology and to insure that articulation occurs among all the schools is strongly recommended.

In addition, all of the suggestions which follow may only be implemented with the continued support of the Board of Education, district and school administrators, teachers, students, parents and community.

Recommendations from the action plan relevant to district outcomes development for mathematics and science will be shared across Englewood Schools and incorporated into overall curriculum implementations.

C. Staff Development:

•Provide staff development workshop for cooperative/collaborative learning styles.

•Provide staff development for tailoring instruction to address diverse learning styles and developmental backgrounds unique to middle school students.

•Provide workshops which create mathematics content in a problem solving context such as:

- spiraling algebraic concepts
- functions and relationships
- estimation
- analyzing tables and graphs
- expectations and predictions
- spatial geometric concepts
- number sense and mental computation.

•Facilitate and encourage ongoing teacher attendance of professional conferences, i.e. Long Island Regional NCTM Conference on December 4-6, 1991.

•Provide staff development on making and using "hands on" manipulatives/math models.

•Provide a staff development workshop on "Writing in the Math Content Area" with the High School Restructuring effort.

D. Incentives and Recognition:

•Implement State Math and National Math contest for all grade levels.

•Reinstate a schoolwide times table test.

•Continue to present meaningful and math-related assembly programs i.e., NASA Assembly Program.

•Begin a schoolwide Mental Arithmetic Bee.

•Begin a math-related poster/project contest.

E. Instructional Materials:

•Submit a "wish list" of preferred math resources including manipulatives and hands on materials to be purchased.

•Maintain a "MAP" room as a central location for math resources; a resource library of current mathematics literature; and a conference room for professional exchange of ideas with hands-on demonstrations.

•Create a Review team to systematically evaluate instructional materials and to identify an appropriate textbook(s) and supplementary materials to implement the curriculum. Acquire materials and textbooks on a three-year plan based on the school and district evaluations and outcome developments.

II. THE USE OF TECHNOLOGY

JDMS's Use of Technology improvement goals stem from the "MAP" ideals:

"The curriculum repsonds to a changing society and is research based."
"Instruction makes appropriate and regular use of technology."

The staff offers the following prioritized recommendations to bring about a more technologically advanced curriculum in order to equip our students with the skills necessary to function in the Twenty First Century.

A. Curriculum Strategies/Considerations:

·Intergrate the use of the computers into the classroom across the curriculum. The computer should be as much a part of the classroom setting as the standard pencil and textbook. It is recommended that computer technology and accessibility be fully incorporated into the daily classroom such that students as well as teachers would have access to hardware, software and ongoing staff development. However, until computer useage is integrated effectively a program should be established whereby each teacher should have time to use the lab and the assistance of the computer resource teacher for instruction.

·Insure that every child receives instructional time on computers every year.

B. Staff Development:

·Provide the following workshops:
- use of Math Explorer calculator
- use of telecommunications.[6]
- use of computers.
- use of fax machine.

C. Management Strategies:

·Re-examine the school schedule with more serious consideration of student's computer time and time spent in the academic subject areas.

·Provide a resource period for the computer teacher to assist teachers with any technical difficulties.

·Ask the Englewood Partners in Public Education (EPPE) to provide speakers for children on the use of math and technology in the business world.

D. Instructional Materials:

·Provide a Projection Systems with a "computer on wheels" for classroom demonstrations.[7]

·Provide a classroom set of the fractional calculators (Math Explorer)[8]

·Equip the computer lab with compatible hardware to insure a higher computer/student ratio.[9]

·Insure that a computer will be provided for every classroom within three years. (Technology, English & Math classrooms given first considerations.)

·Consider an additional computer/(lap top) computer lab needed on an instructional sign-up basis.

·Prepare a software inventory and requisition form and procedure.

III. COLLABORATION/COMMUNICATION

JDMS's Collaboration/Communication improvement goals stem from the "MAP" ideals:

"Schedules enable collaborative planning."
" Parents and community are involved in improving the mathematics program."

The staff offers the following prioritized recommendations to help focus on a more appropriate and meaningful way of bringing about better communication between students, teachers and administrators in the school and between the school and the community.

A. Curriculum Activities:

•Continue to offer "Family Math" and "Family Science."
•Begin a "Family Computing Learning Program."
•Invite parents as "career education" role model speakers.

B. Management Strategies:

•Insure that the schedule allows for a blocked unit of time for Team teaching, Team Planning and meetings with other faculty members, Basic Skills Improvement Program (BSIP) and Special Education teachers.

•Enable the BSIP teachers an opportunity to group and schedule BSIP classes and make lists and schedules available to all teachers to ease attendance record-keeping.

•Continue to use community and industrial resources and attempt to recruit volunteers from civic associations, etc. as tutors, mentors, judges.

•Ask PTO to structure more programs at meetings to help boost attendance and participation in PTO.

•Appoint a parent or community person per homeroom if possible to communicate school's activities/events.

C. School Implementations:

•Include on the report card an effort grade as well as achievement grade for all subjects.

•Minimize report card appointments outside of designated parent conference days.

MATHEMATICS ACTION PLAN FOR

C.W. JOHNSON MIDDLE SCHOOL

Team Members:

Anita Watson - 6th Grade Math
George Green - 7th Grade Math
Donald Carter - Music
Jan Joyner 8th grade - Counselor
Susan Jean Billington - Social Studies
Anthony Georgio - Science
Juanita La Costa - Assistant Principal

Consultant: Sarah Kanes, Mathematics Supervisor

This plan was developed on the basis of ideas generated from our school's use of MAP: The Mathematics Assessment Process for the Middle Grades.

The following Action Plan is the result of a year-long assessment of our mathematics program, conducted collaboratively with faculty from C.W. Johnson Middle School. Under the leadership of the assessment team, we examined the mathematics program at C.W. Johnson Middle School to determine our strengths and the areas in which improvements are needed. The project very effectively united math teachers and other staff with a new commitment to emphasize mathematics learning in our school. The assessment alerted us to many ways we could better support our students by involving them in a more active, hands-on mathematics education. On the basis of data from observations, interviews, and surveys of our faculty, students, and parents, we, the MAP assessment team, recommend the following improvements in mathematics teaching and learning at C.W. Johnson school.

c. CATALYST/NCSU, 1991

School C.W. Johnson Middle

Report Date May 14, 1991

Criteria: PROGRAM STRENGTHS

ACTION PLANNING GUIDE: PART I

Mathematics Program

Strengths

Consistent Criteria and Ideals	Examples	Continuation Plan
<u>Thinking processes</u> develop students as problem solvers, critical thinkers, and effective communicators in mathematics.	Students us correct math language in appropriate ways.	Teachers continue to monitor and correct students' mathematics language usage.
The math content **uses a problem-centered curriculum to develop students' conceptual understanding of mathematics, appreciation for its applications, and proficiency in computational skills.**	Teachers use pacing charts and course outlines. Curriculum is followed in a consistent and orderly manner.	Teachers follow pacing charts and schedule meeting for discussion of progress and evaluation in each grade level.
Developmental Diversity **provides instruction and resources to meet young adolescents' diverse learning needs.**	Students are grouped fairly and equally and have equal access to classroom instruction.	Teachers will continue to assess grouping practices to assure that they stay fair and equitable.
Attitudes **foster positive attitudes about mathematics and encourages and recognizes students' accomplishments.**	Mathelete of the Week awards, Math Education Month, Math Club, math competitions and Super Starts program.	Teachers will upgrade existing program and search for additional ways to motivate students.

School: C.W. Johnson Middle
Report Date May 14, 1991

Criteria:

CONTENT

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
Students will become effective communicators in math by writing at least one biweekly; every teacher will include this in lesson plans for the entire year.	5	1. focused journal writing (log or notebook) 2. open-ended problem solving 3. write proper mathematical terms 4. write solutions to problems in words 5. experience using word analogies with mathematical terms 6. create word problems	Each member of the math department as assigned positions in fall of 1991.	1991-1992 school year

Resources and Assistance Needed
Teachers will explain and demonstrate the actions during planned math department sessions. Successful lessons will be shared among members of the math department and with teachers in other subject areas.

School: C. W. Johnson Middle
Report Date May 14, 1991

Criteria:

PROBLEM SOLVING

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
To develop strategies that involve the use of manipulatives for teaching the metric system.	5	Presentation of mini-workshops to math department members: 1. linear measurement 2. capacity measurement 3. density measurement 4. temperature	Ruth Moss	Two hour meeting in September

Resources and Assistance Needed
Filmstrips Handouts Meter sticks and tapes Scales and weights Liter containers Thermometer See materials proposed for Thinking Criteria

School: C. W. Johnson Middle
Report Date May 14, 1991

Criteria:

THINKING

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
Students will develop a thinking process that reflects multiple strategies for problem solving.	5	A problem-solving unit will be taught during the first quarter at each level using each of the different problem solving strategies that are outlines throughout the curriculum.	Department members	first quarter 1991-92

Resources and Assistance Needed
Order Problem Solving Excel (level D, E, F) for every teacher. Cuisenaire & Creative Publications references Lane Co. Mathematics Project: Problem Solving in Mathematics **REAL NUMBERS** (Dale Seymour)

School: C. W. Johnson Middle
Report Date May 14, 1991

Criteria:

DIVERSITY

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
The members of the math department will meet the diverse needs of adolescents by stressing the motivation of underachievers.	5	1. Display work on a regular basis. 2. Go on a math-related field trip to show the relevance of curriculum in a "real-life" job situation. 3. Find something good about each student's work! 4. Do more cooperative learning activities. 5. Have students identify and display their best work	1. all 2. one field trip-several teachers 3. all 4. all	1. through out year 2. by end of year 3. through out year 4. through out year

Resources and Assistance Needed
Identify field trip contacts; call parents and business community to assist . Cooperative learning activities: University contacts & internal staff

School: C. W. Johnson Middle
Report Date May 14, 1991

Criteria:

Attitudes

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
The mathematics department will foster a positive attitude toward math by using manipulatives and calculators in grades 7 and 8.	5	Develop a unit on using calculators. Have teachers show uses of manipulatives: Watson - geoboards Green - decimal kit Nexton - tiles Berry - Cuisenaire rods Cross - Metric System and how to relate to areas of math Buy class set of calculators for each teachers Buy overhead calculators for each math teacher Incorporate units for family math - buy book Family Math Order class set of Diving into Math Publication	Math dept. members Watson Green Nexton Berry Cross	9/15/91 9/1/91 9/1/91 10/91 9/92

Resources and Assistance Needed
Purchase of materials to foster the use of manipulatives and calculators: (1) calculators, (2) overhead calculators, (3) equipment for students. Build units that use these materials.

School: C. W. Johnson Middle
Report Date May 14, 1991

Criteria:

COLLEGIALITY

ACTION PLANNING GUIDE: PART II

Priorities for Action

Ideal Stated As Goal	Priority	Actions To Be Taken	Who is Responsible	Time Line
The members of the math department will meet monthly to plan collaboratively.	5	1. A member of the department will join NCTM and share ideas from the "Arithmetic Teacher" in different teaching techniques and various content objectives.	Amelia	July '91
		2. A member of the department will subscribe to "The Elementary Mathematician" to obtain new ideas.	Amelia	July '91
		3. Every department member will be given at least 15 copies of the "Scholastic Math Magazine" for use in the classroom.	Amelia	July '91
		4. Department members that teach the same level will plan at least one manipulative or non-routine classroom experience for each unit.	Department members	begin August '91

Resources and Assistance Needed

Scholastic Math Magazine

Inservice by department members in use of manipulatives - geoboard, decimal kit, tiles, Cuisenaire rods, metric system